

References for All Chapters

- [Abou-Sayed, IS; Sorrell, MA; Foster, RA; Atwood, EL; Youngblood, DR.](#) (2011). Haynesville shale development program: From vertical to horizontal. Paper presented at North American Unconventional Gas Conference and Exhibition, June 14-16, 2011, The Woodlands, TX.
- [Abriola, LM; Pinder, GE.](#) (1985a). A multiphase approach to the modeling of porous-media contamination by organic-compounds .2. Numerical-simulation. *Water Resour Res* 21: 19-26.
- [Abriola, LM; Pinder, GE.](#) (1985b). A multiphase approach to the modeling of porous media contamination by organic compounds: 1. Equation development. *Water Resour Res* 21: 11-18.
<http://dx.doi.org/10.1029/WR021i001p00011>
- [Adachi, J; Siebrits, E; Peirce, A; Desroches, J.](#) (2007). Computer simulation of hydraulic fractures. *International Journal of Rock Mechanics and Mining Sciences* 44: 739-757.
<http://dx.doi.org/10.1016/j.ijrmms.2006.11.006>
- [Ajani, A; Kelkar, M.](#) (2012). Interference study in shale plays. Paper presented at SPE Hydraulic Fracturing Technology Conference, February 6-8, 2012, The Woodlands, TX.
- [Al-Ghazal, M; Al-Driweesh, S; Al-Shammari, F.](#) (2013). First successful application of an environment friendly fracturing fluid during on-the-fly proppant fracturing. Paper presented at International Petroleum Technology Conference, March, 26-28, 2013, Beijing, China.
- [Alanco.](#) (2012). New subsidiary Alanco Energy Services, Inc. to provide produced water disposal services to natural gas industry. Alanco. http://www.alanco.com/news_040912.asp
- [Ali, M; Taoutaou, S; Shafqat, AU; Salehapour, A; Noor, S.](#) (2009). The use of self healing cement to ensure long term zonal isolation for HPHT wells subject to hydraulic fracturing operations in Pakistan. Paper presented at International Petroleum Technology Conference, December 7-9, 2009, Doha, Qatar.
- [Ali, SA; Clark, WJ; Moore, WR; Dribus, JR.](#) (2010). Diagenesis and reservoir quality. *Oilfield Rev* 22: 14-27.
- [ALL Consulting](#) (ALL Consulting, LLC). (2004). Coal bed methane primer: New source of natural gas and environmental implications. Tulsa, OK: U.S. Department of Energy, National Petroleum Technology Center.
<http://bogg.dnrc.mt.gov/PDF/Web%20Version.pdf>
- [ALL Consulting](#) (ALL Consulting, LLC). (2012). The modern practices of hydraulic fracturing: A focus on Canadian resources. Tulsa, Oklahoma: ALL Consulting LLC.
- [Allen, TE.](#) (2013). Pregel blender prototype designed to reduce cost and environmental problems. (SPE-27708-MS). Allen, TE. <http://dx.doi.org/10.2118/27708-MS>
- [Alley, B; Beebe, A; Rodgers, I; Castle, JW.](#) (2011). Chemical and physical characterization of produced waters from conventional and unconventional fossil fuel resources. *Chemosphere* 85: 74-82.
<http://dx.doi.org/10.1016/j.chemosphere.2011.05.043>
- [Allison, D; Folds, DS; Harless, DJ; Howell, M; Vargus, GW; Stipetich, A.](#) (2009). Optimizing openhole completion techniques for horizontal foam-drilled wells. Paper presented at SPE Eastern Regional Meeting, September 23-25, 2009, Charleston, WV.
- [Alvarez-Cohen, L; Speitel, GE.](#) (2001). Kinetics of aerobic cometabolism of chlorinated solvents. *Biodegradation* 12: 105-126. <http://dx.doi.org/10.1023/A:1012075322466>
- [Alzahrani, S; Mohammad, AW; Hilal, N; Abdullah, P; Jaafar, O.](#) (2013). Comparative study of NF and RO membranes in the treatment of produced water-Part I: Assessing water quality. *Desalination* 315: 18-26.
<http://dx.doi.org/10.1016/j.desal.2012.12.004>

- [AMEC, Hinckley, HDR](#), (AMEC Environment & Infrastructure, Inc, Hinckley Consulting, HDR Engineering, Inc). (2014). Hydrogeologic study of the Laramie County control area. Prepared for the Wyoming State Engineers Office. Cheyenne, WY: Wyoming State Engineer's Office. <http://seo.wyo.gov/seo/files/Final%20Draft%20Corrected%20Stamped.pdf?attredirects=0&d=1>
- [Aminto, A; Olson, MS](#). (2012). Four-compartment partition model of hazardous components in hydraulic fracturing fluid additives. Journal of Natural Gas Science & Engineering 7: 16-21. <http://dx.doi.org/DOI:10.1016/j.jngse.2012.03.006>
- [ANRC](#) (Arkansas Natural Resources Commission). (2014). Non-riparian water use certification. Available online at <http://anrc.ark.org/divisions/water-resources-management/non-riparian-water-use-certification-program/>
- [API](#) (American Petroleum Institute). (2000). Overview of exploration and production waste volumes and waste management practices in the United States. [http://www.api.org/environment-health-and-safety/environmental-performance/~media/Files/EHS/Environmental Performance/ICF-Waste-Survey-of-EandP-Wastes-2000.ashx](http://www.api.org/environment-health-and-safety/environmental-performance/~media/Files/EHS/Environmental%20Performance/ICF-Waste-Survey-of-EandP-Wastes-2000.ashx)
- [API](#) (American Petroleum Institute). (2005). Modeling study of produced water release scenarios. (Publication Number 4734). Washington, D.C.: API Publishing Services. http://www.api.org/~media/files/ehs/environmental_performance/4734.pdf?la=en
- [API](#) (American Petroleum Institute). (2010a). Isolating potential flow zones during well construction [Standard] (1st ed.). (RP 65-2). Washington, DC: API Publishing Services. <http://www.techstreet.com/products/preview/1695866>
- [API](#) (American Petroleum Institute). (2010b). Water management associated with hydraulic fracturing. Washington, D.C.: API Publishing Services. http://www.api.org/~media/Files/Policy/Exploration/HF2_e1.pdf
- [API](#) (American Petroleum Institute). (2011). Practices for mitigating surface impacts associated with hydraulic fracturing. Washington, DC: API Publishing Services. http://www.shalegas.energy.gov/resources/HF3_e7.pdf
- [Argonne National Laboratory](#). (2014). Water use and management in the Bakken shale oil play. (DOE Award No.: FWP 49462). Pittsburgh, PA: National Energy Technology Laboratory. <http://www.ipd.anl.gov/anlpubs/2014/05/104645.pdf>
- [Arkadakskiy, S.; Rostron, BJ](#). (2012a). Stable isotope geochemistry helps in reducing out-of-zone hydraulic fracturing and unwanted brine production from the Bakken Reservoir. Available online at http://isobrine.com/wp-content/uploads/2013/04/Arkadakskiy_Rostron_20121.pdf
- [Arkadakskiy, S; Rostron, B](#). (2012b). Stable isotope geochemistry helps in reducing out-of-zone hydraulic fracturing and unwanted brine production from the Bakken Reservoir. Available online at <http://isobrine.com/resources/>
- [Arkadakskiy, S; Rostron, B](#). (2013a). Tracking out-of-zone hydraulic fracturing in the Bakken with naturally occurring tracers. Paper presented at GeoConvention 2013: Integration Canadian Society of Petroleum Geologists, May 6-10, 2013, Calgary, AB, Canada.
- [Arkadakskiy, S; Rostron, B](#). (2013b). Tracking out-of-zone hydraulic fracturing in the Bakken with naturally occurring tracers. Paper presented at GeoConvention 2013: Integration, May 6-10, 2013, Calgary, Alberta.
- [Arthur, JD; Bohm, B; Cornue, D](#). (2009a). Environmental considerations of modern shale gas development. Paper presented at SPE Annual Technical Conference and Exhibition, October 4-7, 2009, New Orleans, LA.
- [Arthur, JD; Bohm, B; Coughlin, BJ; Layne, M](#). (2009b). Evaluating the environmental implications of hydraulic fracturing in shale gas reservoirs. Paper presented at SPE Americas E&P Environmental and Safety Conference, March 23-25, 2009, San Antonio, TX.

- [Arthur, JD; Bohm, B; Layne, M.](#) (2008). Hydraulic fracturing considerations for natural gas wells of the Marcellus shale. Paper presented at The Ground Water Protection Council Annual Forum, September 21-24, 2008, Cincinnati, OH.
- [Arthur, JD; Layne, MA; Hochheiser, HW; Arthur, R.](#) (2014). Spatial and statistical analysis of hydraulic fracturing activities in U.S. shale plays and the effectiveness of the FracFocus chemical disclosure system. In 2014 SPE hydraulic fracturing technology conference. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/168640-MS>
- [ATSDR](#) (Agency for Toxic Substances and Disease Registry). (2005). Public health assessment guidance manual (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service. <http://www.atsdr.cdc.gov/hac/PHAManual/toc.html>
- [ATSDR](#) (Agency for Toxic Substances and Disease Registry). (2013). Health consultation: Chesapeake ATGAS 2H well site, Leroy Hill Road, Leroy, Leroy Township, Bradford County, PA. Atlanta, GA: ATSDR, Division of Community Health Investigations. http://www.atsdr.cdc.gov/HAC/pha/ChesapeakeATGASWellSite/ChesapeakeATGASWellSiteHC10282013_508.pdf
- [AWWA](#) (American Water Works Association). (2013). Water and hydraulic fracturing: A white paper from the American Water Works Association. Denver, CO. <http://www.awwa.org/Portals/0/files/legreg/documents/AWWAFrackingReport.pdf>
- [AWWA](#) (American Water Works Association). (1999). Residential end uses of water. In PW Mayer; WB DeOreo (Eds.). Denver, CO: AWWA Research Foundation and American Water Works Association. http://www.waterrf.org/PublicReportLibrary/RFR90781_1999_241A.pdf
- [Ayala, S; Barber, T; Dessinges, MN; Frey, M; Horkowitz, J; Leugemors, E; Pessin, J; Way, CH; Badry, R; Kholy, IE; Galt, A; Hjellesnet, M; Sock, D.](#) (2006). Improving oilfield service efficiency. Houston, TX: Schlumberger Limited. http://www.slb.com/~media/Files/resources/oilfield_review/ors06/aut06/improving_oilfield_service_efficiency.pdf
- [Bacher, D.](#) (2013). Oil company fined \$60,000 for illegally discharging fracking fluid. Available online at https://www.indybay.org/newsitems/2013/11/17/18746493.php?show_comments=1 (accessed March 6, 2015).
- [Bachu, S; Bennion, DB.](#) (2009). Experimental assessment of brine and/or CO2 leakage through well cements at reservoir conditions. Int J Greenhouse Gas Control 3: 494-501. <http://dx.doi.org/10.1016/j.ijggc.2008.11.002>
- [Bair, ES; Digel, RK.](#) (1990). Subsurface transport of inorganic and organic solutes from experimental road spreading of oilfield brine. Ground Water Monitoring and Remediation 10: 94-105.
- [Bair, ES; Freeman, DC; Senko, JM.](#) (2010). Subsurface gas invasion Bainbridge Township, Geauga County, Ohio. (Expert Panel Technical Report). Columbus, OH: Ohio Department of Natural Resources. <http://oilandgas.ohiodnr.gov/resources/investigations-reports-violations-reforms#THR>
- [Baker Hughes.](#) (2014a). Baker Hughes green chemicals program overview. Available online
- [Baker Hughes.](#) (2014b). Well count. U.S. onshore well count [Database]. Houston, TX: Baker Hughes, Inc. Retrieved from <http://phx.corporate-ir.net/phoenix.zhtml?c=79687&p=irol-wellcountus>
- [Baldassare, F.](#) (2011). The origin of some natural gases in Permian through Devonian Age systems in the Appalachian Basin and the relationship to incidents of stray gas migration. Presentation presented at Technical workshop for hydraulic fracturing study, chemical and analytical methods, February 24-25, 2011, Arlington, VA.

- [Baldassare, FJ; McCaffrey, MA; Harper, JA](#). (2014). A geochemical context for stray gas investigations in the northern Appalachian Basin: Implications of analyses of natural gases from Neogene-through Devonian-age strata. AAPG Bulletin 98: 341-372. <http://dx.doi.org/10.1306/06111312178>
- [Banasiak, LJ; Schäfer, AI](#). (2009). Removal of boron, fluoride and nitrate by electro dialysis in the presence of organic matter. J Memb Sci 334: 101-109. <http://dx.doi.org/10.1016/j.memsci.2009.02.020>
- [Barati, R; Liang, JT](#). (2014). A review of fracturing fluid systems used for hydraulic fracturing of oil and gas wells. J Appl Polymer Sci Online pub. <http://dx.doi.org/10.1002/app.40735>
- [Barbot, E; Vidic, NS; Gregory, KB; Vidic, RD](#). (2013). Spatial and temporal correlation of water quality parameters of produced waters from Devonian-age shale following hydraulic fracturing. Environ Sci Technol 47: 2562-2569.
- [Barker, JF; Fritz, P](#). (1981). Carbon isotope fractionation during microbial methane oxidation. Nature 293: 289-291. <http://dx.doi.org/10.1038/293289a0>
- [Barnes, T](#). (2010). 2 drillers fined for Pennsylvania gas well blowout. Available online at <http://www.post-gazette.com/news/environment/2010/07/14/2-drillers-fined-for-Pennsylvania-gas-well-blowout/stories/201007140241> (accessed March 3, 2015).
- [Bartos, TT; Hallberg, LL](#). (2011). Generalized potentiometric surface, estimated depth to water, and estimated saturated thickness of the high plains aquifer system, March-June 2009, Laramie County, Wyoming. Available online at <http://pubs.usgs.gov/sim/3180/>
- [Beckwith, R](#). (2011). Proppants: Where in the world. J Pet Tech 63: 36-41.
- [Bene, PG; Harden, B; Griffin, SW; Nicot, JP](#). (2007). Northern Trinity/Woodbine aquifer groundwater availability model: Assessment of groundwater use in the Northern Trinity aquifer due to urban growth and Barnett shale development. (TWDB Contract Number: 0604830613). Austin, TX: R. W. Harden & Associates, Inc. http://www.twdb.state.tx.us/groundwater/models/gam/trnt_n/TRNT_N_Barnett_Shale_Report.pdf
- [Benko, KL; Drewes, JE](#). (2008). Produced water in the Western United States: Geographical distribution, occurrence, and composition. Environ Eng Sci 25: 239-246.
- [Benotti, MJ; Stanford, BD; Snyder, SA](#). (2010). Impact of drought on wastewater contaminants in an urban water supply. J Environ Qual 39: 1196-1200.
- [Bertoncello, A; Wallace, J; Honarpour, MM; Kabir, C; Blyton, CA](#). (2014). Imbibition and water blockage in unconventional reservoirs: Well management implications during flowback and early production. SPE Journal 17.
- [Bethke, CM; Yeakel, S](#). (2014). The geochemists workbench. Release 10.0. GWB essentials guide (Version Release 10.0). Champaign, IL: Aqueous Solutions, LLC. Retrieved from <http://www.gwb.com/pdf/GWB10/GWBessentials.pdf>
- [Bibby, KJ; Brantley, SL; Reible, DD; Linden, KG; Mouser, PJ; Gregory, KB; Ellis, BR; Vidic, RD](#). (2013). Suggested reporting parameters for investigations of wastewater from unconventional shale gas extraction. Environ Sci Technol 47: 13220-13221. <http://dx.doi.org/10.1021/es404960z>
- [Bishop, RE](#). (2013). Historical analysis of oil and gas well plugging in New York: Is the regulatory system working? New Solutions: A Journal of Environmental and Occupational Health Policy 23: 103-116. <http://dx.doi.org/10.2190/NS.23.1.g>
- [BJ Services Company](#). (2009). BJ fracturing manual 2.0. service company confidential business information document (Revision No. 1 ed. ed.). Houston, TX.
- [Blauch, ME](#). (2010). Developing effective and environmentally suitable fracturing fluids using hydraulic fracturing flowback waters. Paper presented at SPE Unconventional Gas Conference, February 23-25, 2010, Pittsburgh, PA.

- [Blauch, ME; Myers, RR; Moore, TR; Lipinski, BA](#). (2009). Marcellus shale post-frac flowback waters - where is all the salt coming from and what are the implications? In Proceedings of the SPE Eastern Regional Meeting. Richardson, TX: Society of Petroleum Engineers.
- [BLM](#) (Bureau of Land Management). (2013a). Abandoned mine lands: A new legacy. Washington, DC: U.S. Department of the Interior, Bureau of Land Management. http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS_REALTY_AND_RESOURCE_PROTECTION/_aml/aml_documents.Par.81686.File.dat/AML_NewLegacy.pdf
- [BLM](#) (Bureau of Land Management). (2013b). Hydraulic fracturing white paper, appendix e. Casper, WY: Bureau of Land Management, Wyoming State Office. <http://www.blm.gov/pgdata/etc/medialib/blm/wy/information/NEPA/og/2014/02feb.Par.49324.File.dat/v1AppE.pdf>
- [Blondes, MS; Gans, KD; Thordsen, JJ; Reidy, ME; Thomas, B; Engle, MA; Kharaka, YK; Rowan, EL](#). (2014). Data: U.S. Geological Survey National Produced Waters Geochemical Database v2.0 (Provisional) [Database]: U.S. Geological Survey :: USGS. Retrieved from <http://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsofEnergyProductionandUse/ProducedWaters.aspx#3822349-data>
- [Boghici, R](#). (2009). Water quality in the Carrizo-Wilcox aquifer, 1990-2006. (Report 372). Austin, TX: Texas Water Development Board. http://www.twdb.texas.gov/publications/reports/numbered_reports/doc/R372Carrizo-Wilcox.pdf
- [Borrirukwisitsak, S; Keenan, HE; Gauchotte-Lindsay, C](#). (2012). Effects of salinity, pH and temperature on the octanol-water partition coefficient of bisphenol A. IJESD 3: 460-464. <http://dx.doi.org/10.7763/IJESD.2012.V3.267>
- [Boschee, P](#). (2012). Handling produced water from hydraulic fracturing. Oil and Gas Facilities 1: 23-26.
- [Boschee, P](#). (2014). Produced and flowback water recycling and reuse: Economics, limitations, and technology. Oil and Gas Facilities 3: 16-22.
- [Bosworth, S; El-Sayed, HS; Ismail, G; Ohmer, H; Stracke, M; West, C; Retnanto, A](#). (1998). Key issues in multilateral technology. Oilfield Rev 10: 14-28.
- [Bouchard, D; Cornaton, F; Höhener, P; Hunkeler, D](#). (2011). Analytical modelling of stable isotope fractionation of volatile organic compounds in the unsaturated zone. J Contam Hydrol 119: 44-54. <http://dx.doi.org/10.1016/j.jconhyd.2010.09.006>
- [Bouska, V](#). (1981). Geochemistry of coal. New York, NY: Elsevier.
- [Bowen, ZH; Oelsner, GP; Cade, BS; Gallegos, TJ; Farag, AM; Mott, DN; Potter, CJ; Cinotto, PJ; Clark, ML; Kappel, WM; Kresse, TM; Melcher, CP; Paschke, SS; Susong, DD; Varela, BA](#). (2015). Assessment of surface water chloride and conductivity trends in areas of unconventional oil and gas development-Why existing national data sets cannot tell us what we would like to know. Water Resour Res 51: 704-715. <http://dx.doi.org/10.1002/2014WR016382>
- [Boyd, D; Al-Kubti, S; Khedr, OH; Khan, N; Al-Nayadi, K; Degouy, D; Elkadi, A; Kindi, ZA](#). (2006). Reliability of cement bond log interpretations compared to physical communication tests between formations. Paper presented at Abu Dhabi International Petroleum Exhibition and Conference, November 5-8, 2006, Abu Dhabi, UAE.
- [Boyer, CM; Glenn, SA; Claypool, BR; Weida, SD; Adams, JD; Huck, DR; Stidham, JE](#). (2005). Application of viscoelastic fracturing fluids in Appalachian Basin reservoirs (SPE 98068 ed.). Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/98068-MS>
- [Boyer, EW; Swistock, BR; Clark, J; Madden, M; Rizzo, DE](#). (2011). The impact of Marcellus gas drilling on rural drinking water supplies. Harrisburg, PA: The Center for Rural Pennsylvania. <http://www.iogawv.com/Resources/Docs/Marcellus-drinking-water-2011.pdf>

- [Boysen, DB; Boysen, JA; Boysen, JE.](#) (2002). Creative Strategies for Produced Water Disposal in the Rocky Mountain Region. Paper presented at 9th Annual International Petroleum Environmental Conference, October 2002, Albuquerque, NM.
- [Boysen, JE; Harju, JA; Shaw, B; Fosdick, M; Grisanti, A; Sorensen, JA.](#) (1999). The current status of commercial deployment of the freeze thaw evaporation treatment of produced water. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/52700-MS>
- [Brannon, HD; Daulton, DJ; Hudson, HG; Jordan, AK.](#) (2011). Progression toward implementation of environmentally responsible fracturing processes (SPE-147534-MS ed.). Denver, CO: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/147534-MS>
- [Brannon, HD; Daulton, DJ; Post, MA; Hudson, HG; Jordan, AK.](#) (2012). The quest to exclusive use of environmentally responsible fracturing products and systems. Richardson, TX: Society of Petroleum Engineers. <http://www.onepetro.org/mslib/app/Preview.do?paperNumber=SPE-152068-MS&societyCode=SPE>
- [Brannon, HD; Kendrick, DE; Luckey, E; Stipetich, A.](#) (2009). Multistage Fracturing of Horizontal Shale Gas Wells Using >90% Foam Provides Improved Production. In 2009 SPE Eastern regional meeting: limitless potential/formidable challenges (SPE 124767 ed.). Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/124767-MS>
- [Brannon, HD; Pearson, CM.](#) (2007). Proppants and fracture conductivity. In Modern fracturing - enhancing natural gas production (1st ed.). Houston, TX: Energy Tribune Publishing, Inc.
- [Brantley, SL; Yoxtheimer, D; Arjmand, S; Grieve, P; Vidic, R; Pollak, J; Llewellyn, GT; Abad, J; Simon, C.](#) (2014). Water resource impacts during unconventional shale gas development: The Pennsylvania experience. Int J Coal Geol 126: 140-156. <http://dx.doi.org/10.1016/j.coal.2013.12.017>
- [Breit, GN.](#) (2002). USGS Produced waters database. Available online at <http://energy.cr.usgs.gov/prov/prodwat/>
- [Brinck, EL; Frost, CD.](#) (2007). Detecting infiltration and impacts of introduced water using strontium isotopes. Ground Water 45: 554-568. <http://dx.doi.org/10.1111/j.1745-6584.2007.00345.x>
- [Brown, DG; Jaffé, PR.](#) (2001). Effects of nonionic surfactants on bacterial transport through porous media. Environ Sci Technol 35: 3877-3883. <http://dx.doi.org/10.1021/es010577w>
- [Brown, HD; Grijalva, VE; Raymer, LL.](#) (1970). New developments in sonic wave train display and analysis in cased holes. (SPWLA-1970-F). Brown, HD; Grijalva, VE; Raymer, LL. <https://www.onepetro.org/conference-paper/SPWLA-1970-F>
- [Browne, DJ; BD, L.](#) (1999). The development of a rapid hydration on-the-fly crosslinked water fracturing fluid. Paper presented at CSPG and Petroleum Society Joint Convention, Digging Deeper, Finding a Better Bottom Line, June 14 18, 1999, Calgary, Canada.
- [Bruffatto, C; Cochran, J; Conn, L; El-Zeghaty, SZA, A; Fraboulet, B; Griffin, T; James, S; Munk, T; Justus, F; Levine, JR; Montgomery, C; Murphy, D; Pfeiffer, J; Pornpoch, T; Rishmani, L.](#) (2003). From mud to cement - Building gas wells. Oilfield Rev 15: 62-76.
- [Bruff, M; Jikich, SA.](#) (2011). Field demonstration of an integrated water treatment technology solution in Marcellus shale. Paper presented at SPE Eastern Regional Meeting, August 17-19, 2011, Columbus, OH.
- [Byrnes, AP.](#) (2011). Role of induced and natural imbibition in frac fluid transport and fate in gas shales. Presentation presented at Technical Workshops for Hydraulic Fracturing Study: Fate & Transport, March 28-29, 2011, Arlington, VA.

- [California Department of Conservation](#). (2015). Monthly production and injection databases. statewide production and injection data [Database]. Sacramento, CA: California Department of Conservation, Division of Oil, Gas & Geothermal Resources. Retrieved from http://www.conservation.ca.gov/dog/prod_injection_db/Pages/Index.aspx
- [California Department of Water Resources](#). (2015). California state water project overview. Available online at <http://www.water.ca.gov/swp/> (accessed February 20, 2015).
- [Calvert, DG; Smith, DK](#). (1994). Issues and techniques of plugging and abandonment of oil and gas wells. Paper presented at SPE Annual Technical Conference and Exhibition, September 25-28, 1994, New Orleans, LA.
- [Camacho, LM, ar; Dumeé, L; Zhang, J; Li, J; Duke, M; Gomez, J; Gray, S](#). (2013). Advances in membrane distillation for water desalination and purification applications. *Water* 5: 94-196. <http://dx.doi.org/10.3390/w5010094>
- [Caniglia, J](#). (2014). Youngstown contractor sentenced to 28 months for dumping fracking waste. Available online at http://www.cleveland.com/court-justice/index.ssf/2014/08/youngstown_contractor_sentence.html (accessed March 12, 2015).
- [Carter, KE; Hammack, RW; Hakala, JA](#). (2013). Hydraulic Fracturing and Organic Compounds - Uses, Disposal and Challenges. SPE Eastern Regional Meeting, Pittsburgh, Pennsylvania, USA.
- [Castle, SL; Thomas, BF; Reager, JT; Rodell, M; Swenson, SC; Famiglietti, JS](#). (2014). Groundwater depletion during drought threatens future water security of the Colorado River Basin. *Geophys Res Lett* 41: 5904-5911. <http://dx.doi.org/10.1002/2014GL061055>
- [CCST](#) (California Council on Science and Technology). (2014). Advanced well stimulation technologies in California: An independent review of scientific and technical information. Sacramento, CA. <http://ccst.us/publications/2014/2014wst.pdf>
- [CCST](#) (California Council on Science and Technology). (2015). An independent scientific assessment of well stimulation in California, Volume 1: Well stimulation technologies and their past, present, and potential future use in California. Sacramento, CA. <http://www.ccst.us/publications/2015/2015SB4-v1.pdf>
- [Ceres](#) (Coalition for Environmentally Responsible Economies). (2014). Hydraulic fracturing & water stress: water demand by the numbers. Boston, Massachusetts. <https://www.ceres.org/issues/water/shale-energy/shale-and-water-maps/hydraulic-fracturing-water-stress-water-demand-by-the-numbers>
- [Chapman, EC; Capo, RC; Stewart, BW; Kirby, CS; Hammack, RW; Schroeder, KT; Edenborn, HM](#). (2012). Geochemical and strontium isotope characterization of produced waters from Marcellus Shale natural gas extraction. *Environ Sci Technol* 46: 3545-3553.
- [Chaudhuri, S; Ale, S](#). (2013). Characterization of groundwater resources in the Trinity and Woodbine aquifers in Texas. *Sci Total Environ* 452: 333-348. <http://dx.doi.org/10.1016/j.scitotenv.2013.02.081>
- [Chaudhuri, S; Ale, S](#). (2014a). Long term (1960-2010) trends in groundwater contamination and salinization in the Ogallala aquifer in Texas. *J Hydrol* 513: 376-390. <http://dx.doi.org/10.1016/j.jhydrol.2014.03.033>
- [Chaudhuri, S; Ale, S](#). (2014b). Temporal evolution of depth-stratified groundwater salinity in municipal wells in the major aquifers in Texas, USA. *Sci Total Environ* 472: 370-380. <http://dx.doi.org/10.1016/j.scitotenv.2013.10.120>
- [ChemicalBook](#) (ChemicalBook Inc.). (2010). Sorbitan trioleate. Available online at http://www.chemicalbook.com/chemicalproductproperty_en_cb4677178.htm (accessed April 6, 2015).
- [Chester Engineers](#). (2012). The Pittsburgh water and sewer authority 40 year plan. (PWSA Project No. R-D1.10015-11). Pittsburgh, PA: The Pittsburgh Water and Sewer Authority. http://apps.pittsburghpa.gov/pwsa/PWSA_40-year_Plan.pdf

- [Chiado, ED.](#) (2014). The impact of shale gas/oil waste on MSW landfill composition and operations. In CL Meehan; JM VanBriesen; F Vahedifard; X Yu; C Quiroga (Eds.), *Shale energy engineering 2014 technical challenges, environmental issues, and public policy* (pp. 412-420). Reston, VA: American Society of Civil Engineers. <http://dx.doi.org/10.1061/9780784413654.044>
- [Ciezobka, J; Salehi, I.](#) (2013). Controlled hydraulic fracturing of naturally fractured shales: A case study in the Marcellus Shale examining how to identify and exploit natural fractures. (SPE-164524-MS). Ciezobka, J; Salehi, I. <http://dx.doi.org/10.2118/164524-MS>
- [Cipolla, C; Weng, X; Mack, M; Ganguly, U; Gu, H; Kresse, O; Cohen, C.](#) (2011). Integrating microseismic mapping and complex fracture modeling to characterize hydraulic fracture complexity. Paper presented at SPE Hydraulic Fracturing Technology Conference, January 24-26, 2011, The Woodlands, TX.
- [Clark, CE; Horner, RM; Harto, CB.](#) (2013). Life Cycle Water Consumption for Shale Gas and Conventional Natural Gas. *Environ Sci Technol* 47: 11829-11836. <http://dx.doi.org/10.1021/es4013855>
- [Clark, CE; Veil, JA.](#) (2009). Produced water volumes and management practices in the United States (pp. 64). (ANL/EVS/R-09/1). Argonne, IL: Argonne National Laboratory. http://www.circleofblue.org/waternews/wp-content/uploads/2010/09/ANL_EVS_R09_produced_water_volume_report_2437.pdf
- [Cluff, M; Hartsock, A; Macrae, J; Carter, K; Mouser, PJ.](#) (2014). Temporal changes in microbial ecology and geochemistry in produced water from hydraulically fractured Marcellus Shale Gas Wells. *Environ Sci Technol* 48: 6508-6517. <http://dx.doi.org/10.1021/es501173p>
- [COGCC. Colorado Oil and Gas Conservation Commission Order No. 1V-276.](#) (2004). <https://cogcc.state.co.us/orders/orders/1v/276.html>
- [COGCC](#) (Colorado Oil and Gas Conservation Commission). (2014). Risk-based inspections: Strategies to address environmental risk associated with oil and gas operations. (OGCC2014PROJECT #7948). Denver, CO.
- [COGCC](#) (Colorado Oil and Gas Conservation Commission). (2015). COGIS - all production reports to date. Denver, CO. Retrieved from <http://cogcc.state.co.us/>
- [Cohen, HA; Parratt, T; Andrews, CB.](#) (2013). Comments on 'Potential contaminant pathways from hydraulically fractured shale to aquifers' [Comment]. *Ground Water* 51: 317-319; discussion 319-321. <http://dx.doi.org/10.1111/gwat.12015>
- [Colborn, T; Kwiatkowski, C; Schultz, K; Bachran, M.](#) (2011). Natural gas operations from a public health perspective. *Hum Ecol Risk Assess* 17: 1039-1056. <http://dx.doi.org/10.1080/10807039.2011.605662>
- [Coleman, N.](#) (2011). Produced formation water sample results from shale plays. Presentation presented at Technical Workshops for the Hydraulic Fracturing Study: Chemical & Analytical Methods, February 24-25, 2011, Arlington, VA.
- [Colorado Division of Water Resources; Colorado Water Conservation Board; Colorado Oil and Gas Conservation Commission.](#) (2014). Water sources and demand for the hydraulic fracturing of oil and gas wells in Colorado from 2010 through 2015 [Fact Sheet]. <http://cewc.colostate.edu/2012/02/water-sources-and-demand-for-the-hydraulic-fracturing-of-oil-and-gas-wells-in-colorado-from-2010-through-2015/>
- [Considine, T; Watson, R; Considine, N; and Martin, J.](#) (2012). Environmental impacts during Marcellus shale gas drilling: Causes, impacts, and remedies. (Report 2012-1). Buffalo, NY: Shale Resources and Society Institute. <http://cce.cornell.edu/EnergyClimateChange/NaturalGasDev/Documents/UBSRSI-Environmental%20Impact%20Report%202012.pdf>
- [Cooley, H; Gleick, PH; Wolff, G.](#) (2006). Desalination, with a grain of salt: A California perspective. Oakland, CA: Pacific Institute for Studies in Development, Environment, and Security. http://www.pacinst.org/wp-content/uploads/2013/02/desalination_report3.pdf

- [Corseuil, HX; Kaipper, BI; Fernandes, M.](#) (2004). Cosolvency effect in subsurface systems contaminated with petroleum hydrocarbons and ethanol. *Water Res* 38: 1449-1456.
<http://dx.doi.org/10.1016/j.watres.2003.12.015>
- [Corseuil, HX; Monier, AL; Fernandes, M; Schneider, MR; Nunes, CC; Do Rosario, M; Alvarez, PJ.](#) (2011). BTEX plume dynamics following an ethanol blend release: geochemical footprint and thermodynamic constraints on natural attenuation. *Environ Sci Technol* 45: 3422-3429.
<http://dx.doi.org/10.1021/es104055q>
- [Coulter, GR; Gross, BC; Benton, EG; Thomson, CL.](#) (2006). Barnett shale hybrid fracs - One operator's design, application, and results. Richardson, TX: Society of Petroleum Engineers.
<http://dx.doi.org/10.2118/102063-MS>
- [Council of Canadian Academies.](#) (2014). Environmental impacts of shale gas extraction in Canada. Ottawa, Ontario.
http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/Shale%20gas/ShaleGas_fullreportEN.pdf
- [Countess, S; Boardman, G; Hammack, R; Hakala, A; Sharma, S; Parks, J.](#) (2014). Evaluating leachability of residual solids from hydraulic fracturing in the Marcellus shale. In *Shale energy engineering 2014: Technical challenges, environmental issues, and public policy*. Reston, VA: American Society of Civil Engineers. <http://dx.doi.org/10.1061/9780784413654.012>
- [Craig, MS; Wendte, SS; Buchwalter, JL.](#) (2012). Barnett shale horizontal restimulations: A case study of 13 wells. SPE Americas unconventional resources conference, June 5-7, 2012, Pittsburgh, PA.
- [Crescent](#) (Crescent Consulting, LLC). (2011). East Mamm creek project drilling and cementing study. Oklahoma City, OK. <http://cogcc.state.co.us/Library/PiceanceBasin/EastMammCreek/ReportFinal.pdf>
- [Crook, R.](#) (2008). Cementing: Cementing horizontal wells. Halliburton.
- [Curtice, RJ; Salas, WDJ; Paterniti, ML.](#) (2009). To gel or not to gel? In 2009 SPE annual technical conference & exhibition. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/124125-MS>
- [Cusick, M.](#) (2013). EPA fines western PA treatment plants for Marcellus wastewater violations. Available online at <http://stateimpact.npr.org/pennsylvania/2013/05/24/epa-fines-western-pa-treatment-plants-for-marcellus-wastewater-violations/> (accessed March 6, 2015).
- [Dahi Taleghani, A; Ahmadi, M; Olson, JE.](#) (2013). Secondary fractures and their potential impacts on hydraulic fractures efficiency. In *AP In Bunger; J McLennan; R Jeffrey (Eds.), Effective and sustainable hydraulic fracturing*. Croatia: InTech. <http://dx.doi.org/10.5772/56360>
- [Dahi Taleghani, A; Olson, JE.](#) (2009). Numerical modeling of multi-stranded hydraulic fracture propagation: Accounting for the interaction between induced and natural fractures. In 2009 SPE Annual Technical Conference and Exhibition. Richardson, TX: Society of Petroleum Engineers.
<http://dx.doi.org/10.2118/124884-MS>
- [Dahm, K; Chapman, M.](#) (2014). Produced water treatment primer: Case studies of treatment applications. (S&T Research Project #1617). Denver CO: U.S. Department of the Interior.
http://www.usbr.gov/research/projects/download_product.cfm?id=1214.
- [Dahm, KG; Guerra, KL; Xu, P; Drewes, JE.](#) (2011). Composite geochemical database for coalbed methane produced water quality in the Rocky Mountain region. *Environ Sci Technol* 45: 7655-7663.
<http://dx.doi.org/10.1021/es201021n>
- [Dake, LP.](#) (1978). *Fundamentals of reservoir engineering*. Boston, MA: Elsevier.
<http://www.ing.unp.edu.ar/asignaturas/reservorios/Fundamentals%20of%20Reservoir%20Engineering%20%28L.P.%20Dake%29.pdf>

- [Daneshy, AA.](#) (2009). Factors controlling the vertical growth of hydraulic fractures. (SPE-118789-MS). Daneshy, AA. <http://dx.doi.org/10.2118/118789-MS>
- [Darrah, TH; Vengosh, A; Jackson, RB; Warner, NR; Poreda, RJ.](#) (2014). Noble gases identify the mechanisms of fugitive gas contamination in drinking-water wells overlying the Marcellus and Barnett Shales. PNAS 111: 14076-14081. <http://dx.doi.org/10.1073/pnas.1322107111>
- [Daulton, D; Post, M; McMahon, J; Kuc, B; Ake, C; Hughes, B; Hill, D.](#) (2012). Global chemical evaluation process review to qualify regulatory and environmental characteristics for oilfield chemical products. Paper presented at SPE Annual Technical Conference and Exhibition, October 8-10, 2012, San Antonio, TX.
- [Davies, RJ; Almond, S; Ward, RS; Jackson, RB; Adams, C; Worrall, F; Herringshaw, LG; Gluyas, JG; Whitehead, MA.](#) (2014). Oil and gas wells and their integrity: Implications for shale and unconventional resource exploitation. Marine and Petroleum Geology 56: 239-254. <http://dx.doi.org/10.1016/j.marpetgeo.2014.03.001>
- [Davies, RJ; Foulger, GR; Mathias, S; Moss, J; Hustoft, S; Newport, L.](#) (2013). Reply: Davies et al. (2012), Hydraulic fractures: How far can they go? Marine and Petroleum Geology 43: 519-521. <http://dx.doi.org/10.1016/j.marpetgeo.2013.02.001>
- [Davies, RJ; Mathias, SA; Moss, J; Hustoft, S; Newport, L.](#) (2012). Hydraulic fractures: How far can they go? Marine and Petroleum Geology 37: 1-6. <http://dx.doi.org/10.1016/j.marpetgeo.2012.04.001>
- [Davis, JP; Struchtemeyer, CG; Elshahed, MS.](#) (2012). Bacterial communities associated with production facilities of two newly drilled thermogenic natural gas wells in the Barnett Shale (Texas, USA). Microb Ecol 64: 942-954. <http://dx.doi.org/10.1007/s00248-012-0073-3>
- [De Pater, CJ; Baisch, S.](#) (2011). Geomechanical study of the Bowland shale seismicity: Synthesis report. Nottingham, England: British Geological Survey. <https://www.bucknell.edu/script/environmentalcenter/marcellus/default.aspx?articleid=MF08SXMW82CV1MQAXK7ZINIPP>
- [DeArmond, PD; DiGoregorio, AL.](#) (2013a). Characterization of liquid chromatography-tandem mass spectrometry method for the determination of acrylamide in complex environmental samples. Anal Bioanal Chem 405: 4159-4166. <http://dx.doi.org/10.1007/s00216-013-6822-4>
- [DeArmond, PD; DiGoregorio, AL.](#) (2013b). Rapid liquid chromatography-tandem mass spectrometry-based method for the analysis of alcohol ethoxylates and alkylphenol ethoxylates in environmental samples. J Chromatogr A 1305: 154-163. <http://dx.doi.org/10.1016/j.chroma.2013.07.017>
- [Dehghanpour, H; Lan, Q; Saeed, Y; Fei, H; Qi, Z.](#) (2013). Spontaneous imbibition of brine and oil in gas shales: Effect of water adsorption and resulting microfractures. Energy Fuels 27: 3039-3049. <http://dx.doi.org/10.1021/ef4002814>
- [Dehghanpour, H; Zubair, HA; Chhabra, A; Ullah, A.](#) (2012). Liquid intake of organic shales. Energy Fuels 26: 5750-5758. <http://dx.doi.org/10.1021/ef3009794>
- [Demorest, DL; Wallace, ES.](#) (1992). Radiochemical determination of norm in produced water utilizing wet chemistry separation followed by radiochemical analysis. In JP Ray; Engelhardt; Fr (Eds.), Produced water: Technological/environmental issues and solutions (pp. 257-266). New York, NY: Plenum Press. http://dx.doi.org/10.1007/978-1-4615-2902-6_21
- [DOE](#) (U.S. Department of Energy). (2002). Handbook on best management practices and mitigation strategies for coalbed methane in the Montana portion of the Powder River Basin. Tulsa, OK: U.S. Department of Energy, National Energy Technology Laboratory. <http://bogc.dnrc.mt.gov/PDF/BMPHandbookFinal.pdf>
- [DOE](#) (U.S. Department of Energy). (2003). Handbook on coalbed methane produced water: Management and beneficial use alternatives. Tulsa, OK: ALL Consulting. http://www.all-llc.com/publicdownloads/CBM_BU_Screen.pdf

- [DOE](http://seca.doe.gov/technologies/oil-gas/publications/oil_pubs/prodwaterpaper.pdf) (U.S. Department of Energy). (2004). A white paper describing produced water from production of crude oil, natural gas, and coal bed methane. Lemont, IL: Argonne National Laboratory.
http://seca.doe.gov/technologies/oil-gas/publications/oil_pubs/prodwaterpaper.pdf
- [DOE](http://fracfocus.org/sites/default/files/publications/a_guide_to_practical_management_of_produced_water_from_onshore_oil_and_gas_operations_in_the_united_states.pdf) (U.S. Department of Energy). (2006). A guide to practical management of produced water from onshore oil and gas operations in the United States. Washington, DC: U.S. Department of Energy, National Petroleum Technology Office.
http://fracfocus.org/sites/default/files/publications/a_guide_to_practical_management_of_produced_water_from_onshore_oil_and_gas_operations_in_the_united_states.pdf
- [DOE](http://www.netl.doe.gov/technologies/oil-gas/publications/brochures/DOE-NETL-2011-1478%20Marcellus-Barnett.pdf) (U.S. Department of Energy). (2011a). A comparative study of the Mississippian Barnett shale, Fort Worth basin, and Devonian Marcellus shale, Appalachian basin. (DOE/NETL-2011/1478).
<http://www.netl.doe.gov/technologies/oil-gas/publications/brochures/DOE-NETL-2011-1478%20Marcellus-Barnett.pdf>
- [DOE](http://groundwork.iogcc.org/topics-index/shale-gas/topic-resources/shale-gas-applying-technology-to-solve-americas-energy-challe) (U.S. Department of Energy). (2011b). Shale gas Applying technology to solve americas energy challenges. Available online at <http://groundwork.iogcc.org/topics-index/shale-gas/topic-resources/shale-gas-applying-technology-to-solve-americas-energy-challe>
- [Domenico, PA; Schwartz, FW.](#) (1997). Physical and chemical hydrology. In Physical and chemical hydrogeology (2nd ed.). Hoboken, NJ: Wiley.
- [Dresel, PE; Rose, AW.](http://www.marcellus.psu.edu/resources/PDFs/brines.pdf) (2010). Chemistry and origin of oil and gas well brines in western Pennsylvania (pp. 48). (Open-File Report OFOG 1001.0). Harrisburg, PA: Pennsylvania Geological Survey, 4th ser.
<http://www.marcellus.psu.edu/resources/PDFs/brines.pdf>
- [Drewes, J; Cath, T; Debroux, J; Veil, J.](http://aqwatec.mines.edu/research/projects/Tech_Assessment_PW_Treatment_Tech.pdf) (2009). An integrated framework for treatment and management of produced water - Technical assessment of produced water treatment technologies (1st ed.). (RPSEA Project 07122-12). Golden, CO: Colorado School of Mines.
http://aqwatec.mines.edu/research/projects/Tech_Assessment_PW_Treatment_Tech.pdf
- [DrillingInfo, Inc.](http://info.drillinginfo.com/) (2012). DI Desktop August 2012 download [Database]. Austin, TX. Retrieved from <http://info.drillinginfo.com/>
- [DrillingInfo, Inc.](http://info.drillinginfo.com/) (2014a). DI Desktop June 2014 download [Database]. Austin, TX: DrillingInfo. Retrieved from <http://info.drillinginfo.com/>
- [DrillingInfo, Inc.](#) (2014b). DrillingInfo Inc. DI Desktop raw data feed [Database].
- [Drohan, PJ; Brittingham, M.](http://dx.doi.org/10.2136/sssaj2012.0087) (2012). Topographic and soil constraints to shale-gas development in the northcentral Appalachians. Soil Sci Soc Am J 76: 1696-1706. <http://dx.doi.org/10.2136/sssaj2012.0087>
- [Duraismy, RT; Beni, AH; Henni, A.](http://dx.doi.org/10.5772/53478) (2013). State of the art treatment of produced water. In W Elshorbagy; RK Chowdhury (Eds.), Water treatment (pp. 199-222). Rijeka, Croatia: InTech.
<http://dx.doi.org/10.5772/53478>
- [Dusseault, MB; Gray, MN; Nawrocki, PA.](#) (2000). Why oilwells leak: Cement behavior and long-term consequences. Paper presented at SPE International Oil and Gas Conference and Exhibition in China, November 7-10, 2000, Beijing, China.
- [Dutta, R; Lee, C. -H; Odumabo, S; Ye, P; Walker, SC; Karpyn, ZT; Ayala, LF.](#) (2014). Experimental investigation of fracturing-fluid migration caused by spontaneous imbibition in fractured low-permeability sands. SPE Reserv Eval Engin 17: 74-81.
- [Easton, J.](#) (2014). Optimizing fracking wastewater management. Pollution Engineering January 13.
- [Eberhard, M.](#) (2011). Fracture design and stimulation - monitoring. Presentation presented at Technical Workshops for the Hydraulic Fracturing Study: Well Construction & Operations, March 10-11, 2011, Arlington, VA.

- [Economides, MJ; Hill, A, d; Ehlig-Economides, C; Zhu, D.](#) (2013). Petroleum production systems. In Petroleum production systems (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.
- [Economides, MJ; Mikhailov, DN; Nikolaevskiy, VN.](#) (2007). On the problem of fluid leakoff during hydraulic fracturing. *Transport in Porous Media* 67: 487-499. <http://dx.doi.org/10.1007/s11242-006-9038-7>
- [EERC](#) (Energy and Environmental Research Center, University of North Dakota). (2010). Bakken water opportunities assessment phase 1. (2010-EERC-04-03). Grand Forks, ND: Energy and Environmental Research Center. <http://www.undeerc.org/bakken/pdfs/FracWaterPhaseIreport.pdf>
- [EERC](#) (Energy and Environmental Research Center, University of North Dakota). (2011). Bakken water opportunities assessment phase 2: evaluation of brackish groundwater treatment for use in hydraulic fracturing of the Bakken Play, North Dakota. (2011-EERC-12-05). Grand Forks, ND: Energy and Environmental Research Center. <http://www.undeerc.org/Water/pdf/BakkenWaterOppPhase2.pdf>
- [EERC](#) (Energy and Environmental Research Center, University of North Dakota). (2013). BakkenSmart: water [Fact Sheet]. Grand Forks, ND: Energy and Environmental Research Center. <http://www.undeerc.org/bakken/pdfs/NDIC-NDPC-Water-Fact-Sheet.pdf>
- [EIA](#) (Energy Information Administration). (2011a). Review of emerging resources: U.S. shale gas and shale oil plays. United States Department of Energy. <http://www.eia.gov/analysis/studies/usshalegas/>
- [EIA](#) (Energy Information Administration). (2011b). Shale gas and oil plays, lower 48 States [Map]. Available online at http://www.eia.gov/pub/oil_gas/natural_gas/analysis_publications/maps/maps.htm
- [EIA](#) (Energy Information Administration). (2012a). Formation crosswalk. Washington, DC: U.S. Energy Information Administration.
- [EIA](#) (Energy Information Administration). (2012b). Today in energy: Geology and technology drive estimates of technically recoverable resources. Washington, DC: U.S. Energy Information Administration. <http://www.eia.gov/todayinenergy/detail.cfm?id=7190>
- [EIA](#) (Energy Information Administration). (2012c). What is shale gas and why is it important? [December 5]. Washington, DC: U.S. Energy Information Administration. http://www.eia.gov/energy_in_brief/article/about_shale_gas.cfm
- [EIA](#) (Energy Information Administration). (2013a). Analysis & projections: AEO2014 early release overview. Release date: December 16, 2013. Washington, DC: U.S. Energy Information Administration. http://www.eia.gov/forecasts/aeo/er/executive_summary.cfm
- [EIA](#) (Energy Information Administration). (2013b). Annual energy outlook 2013 with projections to 2040. (DOE/EIA-0383). Washington, DC: U.S. Energy Information Administration. [http://www.eia.gov/forecasts/archive/aeo13/pdf/0383\(2013\).pdf](http://www.eia.gov/forecasts/archive/aeo13/pdf/0383(2013).pdf)
- [EIA](#) (Energy Information Administration). (2013c). Technically recoverable shale oil and shale gas resources: an assessment of 137 shale formations in 41 countries outside the United States (pp. 730). Washington, D.C.: Energy Information Administration, U.S. Department of Energy. <http://www.eia.gov/analysis/studies/worldshalegas/>
- [EIA](#) (Energy Information Administration). (2013d). U.S. field production of crude oil. Release date: September 27, 2014. Washington, DC: U.S. Energy Information Administration. <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=mcrfps1&f=a>
- [EIA](#) (Energy Information Administration). (2014a). Annual energy outlook 2014 with projections to 2040. (DOE/EIA-0383(2014)). Washington, D.C.: U.S. Energy Information Administration. [http://www.eia.gov/forecasts/aeo/pdf/0383\(2014\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2014).pdf)

- [EIA](#) (Energy Information Administration). (2014b). Natural gas. U.S. crude oil and natural gas proved reserves. With data for 2012. Table 2. Principal tight oil plays: oil production and proved reserves, 2011-12. Release date: April 10, 2014. Washington, DC: U.S. Energy Information Administration. <http://www.eia.gov/naturalgas/crudeoilreserves/>
- [EIA](#) (Energy Information Administration). (2014c). Natural gas. U.S. Energy Information Administration: Independent statistics and analysis. Available online at <http://www.eia.gov/naturalgas/>
- [EIA](#) (Energy Information Administration). (2014d). Natural gas. U.S. natural gas gross withdrawals. Washington, DC: U.S. Energy Information Administration. http://www.eia.gov/dnav/ng/ng_prod_sum_a_EPG0_FGW_mmcf_a.htm
- [EIA](#) (Energy Information Administration). (2014e). Natural gas: Natural gas prices [Database]. Washington, DC: U.S. Energy Information Administration. Retrieved from http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_nus_a.htm
- [EIA](#) (Energy Information Administration). (2014f). October 2014 month energy review. (DOE/EIA-0035(2014/10)). Washington, D.C.: U.S. Energy Information Administration. <http://www.eia.gov/totalenergy/data/monthly/archive/00351410.pdf>
- [EIA](#) (Energy Information Administration). (2014g). Petroleum & other liquids. Crude oil and natural gas drilling activity. Washington, DC: U.S. Energy Information Administration. http://www.eia.gov/dnav/pet/pet_crd_drill_s1_a.htm
- [EIA](#) (Energy Information Administration). (2014h). Today in energy: Tight oil production pushes U.S. crude supply to over 10% of world total. Washington, DC: U.S. Energy Information Administration. <http://www.eia.gov/todayinenergy/detail.cfm?id=15571>.
- [EIA](#) (Energy Information Administration). (2015a). Glossary. Available online at <http://www.eia.gov/tools/glossary/>
- [EIA](#) (Energy Information Administration). (2015b). Lower 48 states shale plays. Available online at http://www.eia.gov/oil_gas/rpd/shale_gas.pdf
- [Eiceman, GA.](#) (1986). Hazardous organic wastes from natural gas production, processing and distribution: Environmental fates. (WRRRI report, no. 227). New Mexico: Water Resources Research Institute. <http://wrri.nmsu.edu/publish/techrpt/abstracts/abs227.html>
- [Eisner, L; Fischer, T; Le Calvez, JH.](#) (2006). Detection of repeated hydraulic fracturing (out-of-zone growth) by microseismic monitoring. *The Leading Edge* (Tulsa) 25: 548-554. <http://dx.doi.org/10.1190/1.2202655>
- [Elbel, J; Britt, L.](#) (2000). Fracture treatment design. In MJ Economides; KG Nolte (Eds.), *Reservoir stimulation* (3rd ed.). New York, NY: John Wiley & Sons.
- [Ely, JW.](#) (1989). Chapter 7: Fracturing fluids and additives. In JL Gidley; SA Holditch; DE Nierode; RW Veatch Jr (Eds.), *Recent advances in hydraulic fracturing* (pp. 131-146). Richardson, TX: Society of Petroleum Engineers.
- [Enform.](#) (2013). Interim industry recommended practice 24: fracture stimulation: Interwellbore communication 3/27/2013 (1.0 ed.). (IRP 24). Calgary, Alberta: Enform Canada. http://www.enform.ca/safety_resources/publications/PublicationDetails.aspx?a=29&type=irp
- [Engelder, T.](#) (2012). Capillary tension and imbibition sequester frack fluid in Marcellus gas shale [Letter]. *PNAS* 109: E3625; author reply E3626. <http://dx.doi.org/10.1073/pnas.1216133110>
- [Engle, MA; Bern, CR; Healy, RW; Sams, JJ; Zupancic, JW; Schroeder, KT.](#) (2011). Tracking solutes and water from subsurface drip irrigation application of coalbed methane-produced waters, Powder River Basin, Wyoming. *Environmental Geosciences* 18: 169-187.

- [Engle, MA; Rowan, EL.](#) (2014). Geochemical evolution of produced waters from hydraulic fracturing of the Marcellus Shale, northern Appalachian Basin: A multivariate compositional data analysis approach. *Int J Coal Geol* 126: 45-56. <http://dx.doi.org/10.1016/j.coal.2013.11.010>
- [Entrekin, S; Evans-White, M; Johnson, B; Hagenbuch, E.](#) (2011). Rapid expansion of natural gas development poses a threat to surface waters. *Front Ecol Environ* 9: 503-511. <http://dx.doi.org/10.1890/110053>
- [Environment Canada.](#) (2004). Threats to Water Availability in Canada. <http://www.ec.gc.ca/inre-nwri/default.asp?lang=En&n=0CD66675-1>
- [EPA](#) (Environmental Protection Agency). (2000). Development document for effluent limitations guidelines and standards for the centralized waste treatment industry. (821R00020). Washington, DC: U.S. Environmental Protection Agency.
- [ERCB](#) (Energy Resource Conservation Board). (2012). Midway Energy Ltd. hydraulic Fracturing incident: Interwellbore communication January 13, 2012. (ERCB Investigation Report, Red Deer Field Centre). Calgary, Alberta: Energy Resources Conservation Board.
- [Ertel, D; McManus, K; Bogdan, J.](#) (2013). Marcellus wastewater treatment: Case study. In Summary of the technical workshop on wastewater treatment and related modeling (pp. A56-A66). Williamsport, PA: Eureka Resources, LLC. <http://www2.epa.gov/hfstudy/summary-technical-workshop-wastewater-treatment-and-related-modeling>
- [ESN Rocky Mountain](#) (Environmental Services Network Rocky Mountain). (2003). Produced gas and water testing of CBM gas wells in the Raton Basin. Golden, CO. https://cogcc.state.co.us/Library/RatonBasin/ESN%20Final_Report.pdf
- [ESRI](#) (Environmental Systems Research Institute Inc.). (2010). US states shapefile. Redlands, California. Retrieved from <http://www.arcgis.com/home/item.html?id=1a6cae723af14f9cae228b133aebc620>
- [Fakhru'l-Razi, A; Pendashteh, A; Abdullah, LC; Biak, DR; Madaeni, SS; Abidin, ZZ.](#) (2009). Review of technologies for oil and gas produced water treatment [Review]. *J Hazard Mater* 170: 530-551.
- [Famiglietti, JS; Lo, M; Ho, SL; Bethune, J; Anderson, KJ; Syed, TH; Swenson, SC; de Linage, CR; Rodell, M.](#) (2011). Satellites measure recent rates of groundwater depletion in California's Central Valley. *Geophys Res Lett* 38: L03403. <http://dx.doi.org/10.1029/2010GL046442>
- [Frag, AM; Harper, DD.](#) (2014). A review of environmental impacts of salts from produced waters on aquatic resources. *Int J Coal Geol* 126: 157-161. <http://dx.doi.org/10.1016/j.coal.2013.12.006>
- [Ferrar, KJ; Michanowicz, DR; Christen, CL; Mulcahy, N; Malone, SL; Sharma, RK.](#) (2013). Assessment of effluent contaminants from three facilities discharging Marcellus Shale wastewater to surface waters in Pennsylvania. *Environ Sci Technol* 47: 3472-3481.
- [Fertl, WH; Chilingar, GV.](#) (1988). Total organic carbon content determined from well logs. *SPE Formation Evaluation* 3: 407-419. <http://dx.doi.org/10.2118/15612-PA>
- [Fink, JK.](#) (2003). Oil field chemicals. In *Oil field chemicals*. Boston, MA: Gulf Professional Publishing.
- [Finkel, M; Hays, J; Law, A.](#) (2013). The shale gas boom and the need for rational policy. *Am J Public Health* 103: 1161-1163. <http://dx.doi.org/10.2105/AJPH.2013.301285>
- [Fisher, JB; Sublette, KL.](#) (2005). Environmental releases from exploration and production operations in Oklahoma: Type, volume, causes, and prevention. *Environmental Geosciences* 12: 89-99. <http://dx.doi.org/10.1306/eg.11160404039>
- [Fisher, K.](#) (2012). Green frac fluid chemistry optimizes well productivity, environmental performance [Magazine]. *The American Oil and Gas Reporter*, March 2012, 4.
- [Fisher, M; Warpinski, N.](#) (2012). Hydraulic fracture height growth: Real data. *S P E Prod Oper* 27: 8-19. <http://dx.doi.org/10.2118/145949-PA>

- [Fisher, RS.](http://dx.doi.org/10.1046/j.1526-0984.1998.08018.x) (1998). Geologic and geochemical controls on naturally occurring radioactive materials (NORM) in produced water from oil, gas, and geothermal operations. *Environmental Geosciences* 5: 139-150. <http://dx.doi.org/10.1046/j.1526-0984.1998.08018.x>
- [Fitzgerald, DD; McGhee, BF; McGuire, JA.](http://dx.doi.org/10.2118/12141-PA) (1985). Guidelines for 90 % accuracy in zone-isolation decisions. *J Pet Tech* 37: 2013-2022. <http://dx.doi.org/10.2118/12141-PA>
- [Fjaer, E; Holt, RM; Horsrud, P; Raaen, AM; Risnes, R.](#) (2008). *Petroleum related rock mechanics* (2nd edition ed.). Amsterdam, The Netherlands: Elsevier.
- [Flewelling, SA; Sharma, M.](http://dx.doi.org/10.1111/gwat.12095) (2014). Constraints on upward migration of hydraulic fracturing fluid and brine. *Ground Water* 52: 9-19. <http://dx.doi.org/10.1111/gwat.12095>
- [Flewelling, SA; Tymchak, MP; Warpinski, N.](http://dx.doi.org/10.1002/grl.50707) (2013). Hydraulic fracture height limits and fault interactions in tight oil and gas formations. *Geophys Res Lett* 40: 3602-3606. <http://dx.doi.org/10.1002/grl.50707>
- [Flournoy, RM; Feaster, JH.](http://dx.doi.org/10.2118/632-MS) (1963). Field observations on the use of the cement bond log and its application to the evaluation of cementing problems. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/632-MS>
- [Fountain, JC; Jacobi, RD.](http://dx.doi.org/10.2113/gseegeosci.6.3.201) (2000). Detection of buried faults and fractures using soil gas analysis. *Environmental and Engineering Geoscience* 6: 201-208. <http://dx.doi.org/10.2113/gseegeosci.6.3.201>
- [Fredd, CN; Olsen, TN; Brenize, G; Quintero, BW; Bui, T; Glenn, S; Boney, CL.](http://dx.doi.org/10.2118/91433-MS) (2004). Polymer-free fracturing fluid exhibits improved cleanup for unconventional natural gas well applications. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/91433-MS>
- [Freeze, RA; Cherry, JA.](#) (1979). *Groundwater*. Upper Saddle River, NJ: Prentice Hall.
- [Gassiat, C; Gleeson, T; Lefebvre, R; Mckenzie, J.](http://dx.doi.org/10.1002/2013WR014287) (2013). Numerical simulation of potential contamination of shallow aquifers over long time scales. *Water Resour Res* 49: 8310-8327. <http://dx.doi.org/10.1002/2013WR014287>
- [Geiver, L.](http://www.thebakken.com/articles/20/frac-water-treatment-yields-positive-results-for-houston-co) (2013). Frac water treatment yields positive results for Houston Co. Retrieved from <http://www.thebakken.com/articles/20/frac-water-treatment-yields-positive-results-for-houston-co>
- [Georgakakos, A; Fleming, P; Dettinger, M; Peters-Lidard, C; Richmond, TC; Reckhow, K; White, K; Yates, D.](http://www.globalchange.gov/ncadac) (2014). Water resources. In JM Melillo; TC Richmond; GW Yohe (Eds.), *Climate change impacts in the United States* (pp. 69-112). Washington, D.C.: U.S. Global Change Research Program. <http://www.globalchange.gov/ncadac>
- [George, PG; Mace, RE; Petrossian, R.](http://www.twdb.state.tx.us/publications/reports/numbered_reports/doc/R380_AquifersofTexas.pdf) (2011). *Aquifers of Texas*. (Report 380). Austin, TX: Texas Water Development Board. http://www.twdb.state.tx.us/publications/reports/numbered_reports/doc/R380_AquifersofTexas.pdf
- [Gidley, JL; Holditch, SA; Nierode, DE; Veatch Jr., RW.](#) (1989). *Recent advances in hydraulic fracturing*. Richardson, TX: Society of Petroleum Engineers.
- [Gilmore, K; Hupp, R; Glathar, I.](http://dx.doi.org/10.1061/(ASCE)EE.1943-7870.0000810) (2013). Transport of Hydraulic Fracturing Water and Wastes in the Susquehanna River Basin, Pennsylvania. *J Environ Eng* 140: B4013002. [http://dx.doi.org/10.1061/\(ASCE\)EE.1943-7870.0000810](http://dx.doi.org/10.1061/(ASCE)EE.1943-7870.0000810)
- [GNB \(Government of New Brunswick\).](http://www2.gnb.ca/content/dam/gnb/Corporate/pdf/ShaleGas/en/RulesforIndustry.pdf) (2013). *Responsible environmental management of oil and natural gas activities in New Brunswick - rules for industry*. New Brunswick, Canada. <http://www2.gnb.ca/content/dam/gnb/Corporate/pdf/ShaleGas/en/RulesforIndustry.pdf>
- [GNB \(Government of New Brunswick\).](http://www2.gnb.ca/content/dam/gnb/Corporate/pdf/ShaleGas/en/FAQ_HydraulicFracturing.pdf) (2015). *FAQs hydraulic fracturing (fracking)*. New Brunswick, Canada. http://www2.gnb.ca/content/dam/gnb/Corporate/pdf/ShaleGas/en/FAQ_HydraulicFracturing.pdf

- [Goldstein, BD; Brooks, BW; Cohen, SD; Gates, AE; Honeycutt, ME; Morris, JB; Orme-Zavaleta, J; Penning, TM; Snawder, J.](#) (2014). The role of toxicological science in meeting the challenges and opportunities of hydraulic fracturing. *Toxicol Sci* 139: 271-283. <http://dx.doi.org/10.1093/toxsci/kfu061>
- [Gomes, J; Cocke, D; Das, K; Guttula, M; Tran, D; Beckman, J.](#) (2009). Treatment of produced water by electrocoagulation. Shiner, TX: KASELCO, LLC. <http://www.kaselco.com/index.php/library/industry-white-papers>
- [Gonneea, ME; Morris, PJ; Dulaiova, H; Charette, MA.](#) (2008). New perspectives on radium behavior within a subterranean estuary. *Mar Chem* 109: 250-267. <http://dx.doi.org/10.1016/j.marchem.2007.12.002>
- [Goodwin, KJ; Crook, RJ.](#) (1992). Cement sheath stress failure. *S P E Drilling & Completion* 7: 291-296. <http://dx.doi.org/10.2118/20453-PA>
- [Goodwin, S; Carlson, K; Knox, K; Douglas, C; Rein, L.](#) (2014). Water intensity assessment of shale gas resources in the Wattenberg field in northeastern Colorado. *Environ Sci Technol* 48: 5991-5995. <http://dx.doi.org/10.1021/es404675h>
- [Gorody, AW.](#) (2012). Factors affecting the variability of stray gas concentration and composition in groundwater. *Environmental Geosciences* 19: 17-31. <http://dx.doi.org/10.1306/eg.12081111013>
- [Gradient.](#) (2013). National human health risk evaluation for hydraulic fracturing fluid additives. Gradient. http://www.energy.senate.gov/public/index.cfm/files/serve?File_id=53a41a78-c06c-4695-a7be-84225aa7230f
- [Greenhunter](#) (Greenhunter Resources). (2014). Oilfield water management solutions. Available online at <http://www.greenhunterenergy.com/operations/owms.htm>
- [Gregory, KB; Vidic, RD; Dzombak, DA.](#) (2011). Water management challenges associated with the production of shale gas by hydraulic fracturing. *Elements* 7: 181-186.
- [Gross, SA; Avens, HJ; Banducci, AM; Sahmel, J; Panko, JM; Tvermoes, BE.](#) (2013). Analysis of BTEX groundwater concentrations from surface spills associated with hydraulic fracturing operations. *J Air Waste Manag Assoc* 63: 424-432. <http://dx.doi.org/10.1080/10962247.2012.759166>
- [GTI](#) (Gas Technology Institute). (2012). Barnett and Appalachian shale water management and reuse technologies. (Report no. 08122-05.FINAL.1). Sugar Land, TX: Research Partnership to Secure Energy for America, RPSEA. <https://www.netl.doe.gov/file%20library/research/oil-gas/Natural%20Gas/shale%20gas/08122-05-final-report.pdf>
- [Gu, H; Siebrits, E.](#) (2008). Effect of formation modulus contrast on hydraulic fracture height containment. *S P E Prod Oper* 23: 170-176. <http://dx.doi.org/10.2118/103822-PA>
- [Gu, M; Mohanty, KK.](#) (2014). Effect of foam quality on effectiveness of hydraulic fracturing in shales. *International Journal of Rock Mechanics and Mining Sciences* 70: 273-285. <http://dx.doi.org/10.1016/j.ijrmms.2014.05.013>
- [Guerra, K; Dahm, K; Dunderf, S.](#) (2011). Oil and gas produced water management and beneficial use in the western United States. (Science and Technology Program Report No. 157). Denver, CO: U.S. Department of the Interior Bureau of Reclamation.
- [Gupta, DVS; Hlidek, BT.](#) (2009). Frac fluid recycling and water conservation: A case history. In 2009 Hydraulic fracturing technology conference. Woodlands, Texas: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/119478-MS>
- [Gupta, DVS; Valkó, P.](#) (2007). Fracturing fluids and formation damage. In M Economides; T Martin (Eds.), *Modern fracturing: enhancing natural gas production* (pp. 227-279). Houston, TX: Energy Tribune Publishing Inc.

- [GWPC](http://www.gwpc.org/sites/default/files/state_oil_and_gas_regulations_designed_to_protect_water_resources_0.pdf) (Groundwater Protection Council). (2009). State oil and natural gas regulations designed to protect water resources. Morgantown, WV: U.S. Department of Energy, National Energy Technology Laboratory. http://www.gwpc.org/sites/default/files/state_oil_and_gas_regulations_designed_to_protect_water_resources_0.pdf
- [GWPC](http://www.gwpc.org/sites/default/files/files/Oil%20and%20Gas%20Regulation%20Report%20Hyperlinked%20Version%20Final-rfs.pdf) (Groundwater Protection Council). (2014). State oil and natural gas regulations designed to protect water resources. Morgantown, WV: U.S. Department of Energy, National Energy Technology Laboratory. <http://www.gwpc.org/sites/default/files/files/Oil%20and%20Gas%20Regulation%20Report%20Hyperlinked%20Version%20Final-rfs.pdf>
- [GWPC](http://fracfocus.org/) (Groundwater Protection Council). (2015). FracFocus - chemical disclosure registry. Available online at <http://fracfocus.org/>
- [GWPC and ALL Consulting](http://www.gwpc.org/sites/default/files/Shale%20Gas%20Primer%202009.pdf) (Ground Water Protection Council (GWPC) and ALL Consulting). (2009). Modern shale gas development in the United States: A primer. (DE-FG26-04NT15455). Washington, DC: U.S. Department of Energy, Office of Fossil Energy and National Energy Technology Laboratory. <http://www.gwpc.org/sites/default/files/Shale%20Gas%20Primer%202009.pdf>
- [GWPC and IOGCC](http://fracfocus.org/hydraulic-fracturing-how-it-works/drilling-risks-safeguards) (Ground Water Protection Council and Interstate Oil and Gas Compact Commission). (2014). Fracturing fluid management. Available online at <http://fracfocus.org/hydraulic-fracturing-how-it-works/drilling-risks-safeguards> (accessed December 12, 2014).
- [H.R. Rep. 111-316. Department of the Interior, Environment, and Related Agencies Appropriation Act, 2010: Conference report](http://www.gpo.gov/fdsys/pkg/CRPT-111hrpt316/pdf/CRPT-111hrpt316.pdf) (to accompany H.R. 2996), (2009). <http://www.gpo.gov/fdsys/pkg/CRPT-111hrpt316/pdf/CRPT-111hrpt316.pdf>
- [Halliburton](http://www.regulations.gov/#!documentDetail;D=EPA-HQ-ORD-2010-0674-1634). (1988). Primer on Hydraulic Fracturing. Provided to EPA on March 2, 2011. Available at Docket ID: EPA-HQ-ORD-2010-0674-1634. (HESI-3031). Halliburton. <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-ORD-2010-0674-1634>
- [Halliburton](http://www.halliburton.com/public/projects/pubsdata/hydraulic_fracturing/index.html). (2013). Hydraulic fracturing 101. Available online at http://www.halliburton.com/public/projects/pubsdata/hydraulic_fracturing/index.html
- [Halliburton](http://www.halliburton.com/public/projects/pubsdata/hydraulic_fracturing/fracturing_101.html). (2014). Hydraulic fracturing 101. Available online at http://www.halliburton.com/public/projects/pubsdata/hydraulic_fracturing/fracturing_101.html
- [Haluszczak, LO; Rose, AW; Kump, LR](http://dx.doi.org/10.1016/j.apgeochem.2012.10.002). (2013). Geochemical evaluation of flowback brine from Marcellus gas wells in Pennsylvania, USA. *Appl Geochem* 28: 55-61. <http://dx.doi.org/10.1016/j.apgeochem.2012.10.002>
- [Hamieh, BM; Beckman, JR](http://dx.doi.org/10.1016/j.desal.2005.09.034). (2006). Seawater desalination using Dewvaporation technique: theoretical development and design evolution. *Desalination* 195: 1-13. <http://dx.doi.org/10.1016/j.desal.2005.09.034>
- [Hammack, R; Harbert, W; Sharma, S; Stewart, B; Capo, R; Wall, A; Wells, A; Diehl, R; Blaushild, D; Sams, J; Veloski, G](http://www.netl.doe.gov/File%20Library/Research/onsite%20research/publications/NETL-TRS-3-2014_Greene-County-Site_20140915_1_1.pdf). (2014). An evaluation of fracture growth and gas/fluid migration as horizontal Marcellus Shale gas wells are hydraulically fractured in Greene County, Pennsylvania. (NETL-TRS-3-2014). Pittsburgh, PA: U.S. Department of Energy, National Energy Technology Laboratory. http://www.netl.doe.gov/File%20Library/Research/onsite%20research/publications/NETL-TRS-3-2014_Greene-County-Site_20140915_1_1.pdf
- [Hammer, R; VanBriesen, J](http://www.nrdc.org/energy/files/fracking-wastewater-fullreport.pdf). (2012). In frackings wake: New rules are needed to protect our health and environment from contaminated wastewater. New York, NY: Natural Resources Defense Council. <http://www.nrdc.org/energy/files/fracking-wastewater-fullreport.pdf>
- [Hansen, E; Mulvaney, D; Betcher, M](http://www.downstreamstrategies.com/documents/reports_publication/marcellus_wv_pa.pdf). (2013). Water resource reporting and water footprint from Marcellus Shale development in West Virginia and Pennsylvania. Durango, CO: Earthworks Oil & Gas Accountability Project. http://www.downstreamstrategies.com/documents/reports_publication/marcellus_wv_pa.pdf

- [Harms, WM; Yeager, R.](#) (1987). Diesel-based gel concentrate reduces stimulation costs. *Oil and Gas Journal* 85: 37-39.
- [Harrison, SS.](#) (1983). Evaluating system for ground-water contamination hazards due to gas-well drilling on the Glaciated Appalachian Plateau. *Ground Water* 21: 689-700. <http://dx.doi.org/10.1111/j.1745-6584.1983.tb01940.x>
- [Harrison, SS.](#) (1985). Contamination of aquifers by overpressurizing the annulus of oil and gas wells. *Ground Water* 23: 317-324.
- [Hayes, T.](#) (2009). Sampling and analysis of water streams associated with the development of Marcellus shale gas. Des Plaines, IL: Marcellus Shale Coalition. <http://eidmarcellus.org/wp-content/uploads/2012/11/MSCommission-Report.pdf>
- [Hayes, T.](#) (2011). Characterization of Marcellus and Barnett shale flowback waters and technology development for water reuse. Paper presented at Hydraulic Fracturing Study: March 2011 Technical Workshop on Water Resource Management, March 29-30, 2011, Arlington, VA.
- [Hayes, T; Severin, B.](#) (2012a). Characterization of flowback water from the the Marcellus and the Barnett shale regions. Barnett and Appalachian shale water management and reuse technologies. (08122-05.09; Contract 08122-05). Hayes, T; Severin, B. http://www.rpsea.org/media/files/project/2146b3a0/08122-05-RT-Characterization_Flowback_Waters_Marcellus_Barnett_Shale_Regions-03-20-12.pdf
- [Hayes, T; Severin, BF.](#) (2012b). Evaluation of the aqua-pure mechanical vapor recompression system in the treatment of shale gas flowback water - Barnett and Appalachian shale water management and reuse technologies. (08122-05.11). Hayes, T; Severin, BF. <http://barnettshalewater.org/documents/08122-05.11-EvaluationofMVR-3-12-2012.pdf>
- [Hayes, TD; Halldorson, B; Horner, P; Ewing, J; Werline, JR; Severin, BF.](#) (2014). Mechanical vapor recompression for the treatment of shale-gas flowback water. *Oil and Gas Facilities* 3: 54-62.
- [Haymond, D.](#) (1991). The Austin Chalk - An overview. *HGS Bulletin* 33: 27-30, 32, 34.
- [He, Z.](#) (2011). Flow of gas and water in hydraulically fractured shale gas reservoirs. EPA HF Workshop, March 28-29, 2011, Arlington, VA.
- [Healy, RW; Bartos, TT; Rice, CA; Mckinley, MP; Smith, BD.](#) (2011). Groundwater chemistry near an impoundment for produced water, Powder River Basin, Wyoming, USA. *J Hydrol* 403: 37-48. <http://dx.doi.org/10.1016/j.jhydrol.2011.03.042>
- [Healy, RW; Rice, CA; Bartos, TT; Mckinley, MP.](#) (2008). Infiltration from an impoundment for coal-bed natural gas, Powder River Basin, Wyoming: Evolution of water and sediment chemistry. *Water Resour Res* 44: n/a-n/a. <http://dx.doi.org/10.1029/2007wr006396>
- [Heermann, SE; Powers, SE.](#) (1998). Modeling the partitioning of BTEX in water-reformulated gasoline systems containing ethanol. *J Contam Hydrol* 34: 315-341. [http://dx.doi.org/10.1016/S0169-7722\(98\)00099-0](http://dx.doi.org/10.1016/S0169-7722(98)00099-0)
- [Heilweil, VM; Stolp, BJ; Kimball, BA; Susong, DD; Marston, TM; Gardner, PM.](#) (2013). A stream-based methane monitoring approach for evaluating groundwater impacts associated with unconventional gas development. *Ground Water* 51: 511-524. <http://dx.doi.org/10.1111/gwat.12079>
- [Hladik, ML; Focazio, MJ; Engle, M.](#) (2014). Discharges of produced waters from oil and gas extraction via wastewater treatment plants are sources of disinfection by-products to receiving streams. *Sci Total Environ* 466. <http://dx.doi.org/10.1016/j.scitotenv.2013.08.008>
- [Holditch, SA.](#) (2007). Chapter 8: Hydraulic fracturing. In JD Clegg (Ed.), *Petroleum engineering handbook* (pp. IV-323 - IV-366). Richardson, TX: Society of Petroleum Engineers. <http://store.spe.org/Petroleum-Engineering-Handbook-Volume-IV-Production-Operations-Engineering-P61.aspx>

- [Holtsclaw, J; Loveless, D; Saini, R; Fleming, J.](#) (2011). SPE 146832: Environmentally-focused crosslinked gel system results in high retained proppant-pack conductivity. Presentation presented at Society of Petroleum Engineers Annual Conference, November 2, 2011, Denver, CO.
- [Horn, A; Hu, J; Patton, M.](#) (2013). QA/QC of water blending enhances crosslinked gel completions. Available online at <http://content.stockpr.com/hydrozonix/files/downloads/1013HEP-hydrozonix.pdf>
- [Horsey, CA.](#) (1981). Depositional environments of the Pennsylvanian Pottsville Formation in the Black Warrior Basin of Alabama. *Journal of Sedimentary Research* 51: 799-806.
<http://dx.doi.org/10.1306/212F7DB5-2B24-11D7-8648000102C1865D>
- [House of Representatives](#) (U.S. House of Representatives). (2011). Chemicals used in hydraulic fracturing. Washington, D.C.: U.S. House of Representatives, Committee on Energy and Commerce, Minority Staff. <http://democrats.energycommerce.house.gov/sites/default/files/documents/Hydraulic-Fracturing-Chemicals-2011-4-18.pdf>
- [Houston, N; Blauch, M; Weaver, D; Miller, DS; O'Hara, D.](#) (2009). Fracture-stimulation in the Marcellus shale: Lessons learned in fluid selection and execution. In 2009 SPE eastern regional meeting: limitless potential/formidable challenges. Richardson, TX: Society of Petroleum Engineers.
<http://dx.doi.org/10.2118/125987-MS>
- [Hristozov, DR; Zabeo, A; Foran, C; Isigonis, P; Critto, A; Marcomini, A; Linkov, I.](#) (2014). A weight of evidence approach for hazard screening of engineered nanomaterials. *Nanotoxicology* 8: 72-87.
<http://dx.doi.org/10.3109/17435390.2012.750695>
- [Hulme, D.](#) (2005). CBM co-produced water management, disposal, treatment and use. Hulme, D.
<http://www.uwyo.edu/haub/ruckelshaus-institute/files/docs/publications/2005-cbm-water-management-hulme.pdf>
- [Hunter, JA; Moser, PH.](#) (1990). Ground water availability in Jefferson County, Alabama: geological survey special map 224. Tuscaloosa, AL: Geological Survey of Alabama.
http://www.ogb.state.al.us/documents/pubs/onlinepubs/Special_Maps/SM224_PDF
- [Hyne, NJ.](#) (2012). Nontechnical guide to petroleum geology, exploration, drilling and production. In *Nontechnical guide to petroleum geology, exploration, drilling and production* (3 ed.). Tulsa, OK: PennWell Corporation.
- [IAEA](#) (International Atomic Energy Agency). (2014). The environmental behaviour of radium: revised edition. Vienna, Austria. http://www-pub.iaea.org/MTCD/Publications/PDF/trs476_web.pdf
- [Igunnu, ET; Chen, GZ.](#) (2014). Produced water treatment technologies. *International Journal of Low-Carbon Technologies* 9: 157-177. <http://dx.doi.org/10.1093/ijlct/cts049>
- [IHS](#) (Global Insight). (2009). Measuring the economic and energy impacts of proposals to regulate hydraulic fracturing. Prepared for American Petroleum Institute. Lexington, MA: IHS Global Insight.
http://s3.amazonaws.com/propublica/assets/natural_gas/ihs_gi_hydraulic_fracturing_task1.pdf
- [IHS](#) (Global Insight). (2013). Americas new energy future: The unconventional oil and gas revolution and the US economy. Douglas County, Colorado.
http://www.energyxxi.org/sites/default/files/pdf/Americas_New_Energy_Future_Phase3.pdf
- [Ingraffea, AR; Wells, MT; Santoro, RL; Shonkoff, SB.](#) (2014). Assessment and risk analysis of casing and cement impairment in oil and gas wells in Pennsylvania, 2000-2012. *PNAS* 111: 1095510960.
<http://dx.doi.org/10.1073/pnas.1323422111>
- [IOGCC](#) (Interstate Oil and Gas Compact Commission). (2002). States experience with hydraulic fracturing. A survey of the interstate oil and gas compact commission. IOGCC (Interstate Oil and Gas Compact Commission). <http://energyindepth.org/docs/pdf/IOGCC%20Hydraulic%20Fracturing%20Study%202007-2002.pdf>

- [IOGCC](#) (Interstate Oil and Gas Compact Commission). (2008). Protecting our country's resources: The states' case, orphaned well plugging initiative. Oklahoma City, OK: Interstate Oil and Gas Compact Commission (IOGCC). <http://iogcc.myshopify.com/products/protecting-our-countrys-resources-the-states-case-orphaned-well-plugging-initiative-2008>
- [IOGCC](#) (Interstate Oil and Gas Compact Commission). (2015). Groundwork: hydraulic fracturing - state progress. Available online at <http://groundwork.iogcc.ok.gov/topics-index/hydraulic-fracturing/state-progress>
- [IPCC](#) (Intergovernmental Panel on Climate Change). (2007). Climate change 2007: Impacts, adaptation and vulnerability. Cambridge, UK: Cambridge University Press. <http://www.ipcc.ch/ipccreports/ar4-wg2.htm>
- [Irwin, C.](#) (2013). Hydraulic fracturing: A way to go greener? Available online at <http://breakingenergy.com/2013/04/23/hydraulic-fracturing-a-way-to-go-greener/>
- [IUPAC](#) (International Union of Pure and Applied Chemistry). (2014). Gold Book: matrix effect. Available online at <http://goldbook.iupac.org/M03759.html> (accessed April 8, 2015).
- [Jackson, G; Flores, C; Abolo, N; Lawal, H.](#) (2013a). A novel approach to modeling and forecasting frac hits in shale gas wells. Paper presented at EAGE Annual Conference & Exhibition incorporating SPE Europec, June 10-13, 2013, London, UK.
- [Jackson, RB; Carpenter, SR; Dahm, CN; Mcknight, DM; Naiman, RJ; Postel, SL; Running, SW.](#) (2001). Water in a changing world. *Ecol Appl* 11: 1027-1045. [http://dx.doi.org/10.1890/1051-0761\(2001\)011\[1027:WIACW\]2.0.CO;2](http://dx.doi.org/10.1890/1051-0761(2001)011[1027:WIACW]2.0.CO;2)
- [Jackson, RB; Vengosh, A; Darrah, TH; Warner, NR; Down, A; Poreda, RJ; Osborn, SG; Zhao, K; Karr, ID.](#) (2013b). Increased stray gas abundance in a subset of drinking water wells near Marcellus shale gas extraction. *PNAS* 110: 11250-11255. <http://dx.doi.org/10.1073/pnas.1221635110>
- [Jackson, RE; Dusseault, MB.](#) (2014). Gas release mechanisms from energy wellbores. Presentation presented at 48th US Rock Mechanics/Geomechanics Symposium, June 1-4, 2014, Minneapolis, Minnesota.
- [Jackson, RE; Gorody, AW; Mayer, B; Roy, JW; Ryan, MC; Van Stempvoort, DR.](#) (2013c). Groundwater protection and unconventional gas extraction: the critical need for field-based hydrogeological research. *Ground Water* 51: 488-510. <http://dx.doi.org/10.1111/gwat.12074>
- [Jacob, R.](#) (2011). Incident action plan, Franchuk 44-20 SWH incident. Plano, Texas: Denbury Onshore, LLC.
- [Jiang, M; Hendrickson, CT; Vanbriesen, JM.](#) (2014). Life Cycle Water Consumption and Wastewater Generation Impacts of a Marcellus Shale Gas Well. *Environ Sci Technol* 48: 1911-1920. <http://dx.doi.org/10.1021/es4047654>
- [Jones, JR; Britt, LK.](#) (2009). Design and appraisal of hydraulic fractures. In Design and appraisal of hydraulic fractures. Richardson, TX: Society of Petroleum Engineers.
- [Judson, R; Richard, A; Dix, DJ; Houck, K; Martin, M; Kavlock, R; Dellarco, V; Henry, T; Holderman, T; Sayre, P; Tan, S; Carpenter, T; Smith, E.](#) (2009). The toxicity data landscape for environmental chemicals [Review]. *Environ Health Perspect* 117: 685-695. <http://dx.doi.org/10.1289/ehp.0800168>
- [Kahrilas, GA; Blotevogel, J; Stewart, PS; Borch, T.](#) (2015). Biocides in hydraulic fracturing fluids: a critical review of their usage, mobility, degradation, and toxicity. *Environ Sci Technol* 49: 16-32. <http://dx.doi.org/10.1021/es503724k>
- [Kansas Water Office.](#) (2014). How is water used in oil and gas exploration in Kansas? Topeka, KA. http://www.kwo.org/about_us/BACs/KWIF/rpt_Hydraulic%20Fracturing_KS_Water_FAQ_03082012_final.ki.pdf
- [Kappel, WM.](#) (2013). Dissolved methane in groundwater, Upper Delaware River Basin, Pennsylvania and New York (pp. 1-6). (2013-1167). U. S. Geological Survey. <http://pubs.usgs.gov/of/2013/1167/pdf/ofr2013-1167.pdf>

- [Kappel, WM; Nystrom, EA](#). (2012). Dissolved methane in New York groundwater, 1999-2011. (Open-File Report 2012-1162). Washington, DC: U.S. Geological Survey. <http://pubs.usgs.gov/of/2012/1162/>
- [Kappel, WM; Williams, JH; Szabo, Z](#). (2013). Water resources and shale gas/oil production in the Appalachian basin critical issues and evolving developments. (Open-File Report 2013-1137). Troy, NY: U.S. Geological Survey. <http://pubs.usgs.gov/of/2013/1137/pdf/ofr2013-1137.pdf>
- [Kargbo, DM; Wilhelm, RG; Campbell, DJ](#). (2010). Natural gas plays in the Marcellus Shale: Challenges and potential opportunities. Environ Sci Technol 44: 5679-5684. <http://dx.doi.org/10.1021/es903811p>
- [Kassotis, CD; Tillitt, DE; Wade Davis, J; Hormann, AM; Nagel, SC](#). (2014). Estrogen and androgen receptor activities of hydraulic fracturing chemicals and surface and ground water in a drilling-dense region. Endocrinology 155: 897-907. <http://dx.doi.org/10.1210/en.2013-1697>
- [Kaushal, SS; Groffman, PM; Likens, GE; Belt, KT; Stack, WP; Kelly, VR; Band, LE; Fisher, GT](#). (2005). Increased salinization of fresh water in the northeastern United States. PNAS 102: 13517-13520. <http://dx.doi.org/10.1073/pnas.0506414102>
- [Kell, S](#). (2011). State oil and gas agency groundwater investigations and their role in advancing regulatory reforms, a two-state review: Ohio and Texas. Ground Water Protection Council. http://fracfocus.org/sites/default/files/publications/state_oil_gas_agency_groundwater_investigations_optimized.pdf
- [Kelly, WR](#). (2008). Long-term trends in chloride concentrations in shallow aquifers near Chicago. Ground Water 46: 772-781. <http://dx.doi.org/10.1111/j.1745-6584.2008.00466.x>
- [Kennedy/Jenks Consultants](#). (2002). Evaluation of technical and economic feasibility of treating oilfield produced water to create a new water resource. http://www.gwpc.org/sites/default/files/event-sessions/Roger_Funston_PWC2002_0.pdf
- [Kenny, JF; Barber, NL; Hutson, SS; Linsey, KS; Lovelace, JK; Maupin, MA](#). (2009). Estimated use of water in the United States in 2005. (Circular 1344). Reston, VA: U.S. Geological Survey. <http://pubs.usgs.gov/circ/1344/>
- [Kharaka, YK; Kakouros, E; Abbott, MM](#). (2002). Environmental impacts of petroleum production: 1- The fate of inorganic and organic chemicals in produced water from the Osage-Skiatook Petroleum Environmental Research B site, Osage County, OK. 9th International Petroleum Environmental Conference, October 22-25, 2002, Albuquerque, NM.
- [Kharaka, YK; Kakouros, E; Thordsen, JJ; Ambats, G; Abbott, MM](#). (2007). Fate and groundwater impacts of produced water releases at OSPER B site, Osage County, Oklahoma. Appl Geochem 22: 2164-2176. <http://dx.doi.org/10.1016/j.apgeochem.2007.04.005>
- [Kim, GH; Wang, JY](#). (2014). Interpretation of hydraulic fracturing pressure in tight gas formations. Journal of Energy Resources Technology 136: 032903. <http://dx.doi.org/10.1115/1.4026460>
- [Kim, J; Moridis, GJ](#). (2013). Development of the T+M coupled flowgeomechanical simulator to describe fracture propagation and coupled flowthermalgeomechanical processes in tight/shale gas systems. Computers and Geosciences 60: 184-198. <http://dx.doi.org/10.1016/j.cageo.2013.04.023>
- [Kim, J; Moridis, GJ](#). (2015). Numerical analysis of fracture propagation during hydraulic fracturing operations in shale gas systems. International Journal of Rock Mechanics and Mining Sciences 76: 127-137.
- [Kim, J; Um, ES; Moridis, GJ](#). (2014). Fracture propagation, fluid flow, and geomechanics of water-based hydraulic fracturing in shale gas systems and electromagnetic geophysical monitoring of fluid migration. SPE Hydraulic Fracturing Technology Conference, February 4-6, 2014, The Woodlands, Texas.
- [King, G; King, D](#). (2013). Environmental risk arising from well-construction failure: Differences between barrier and well failure, and estimates of failure frequency across common well types, locations, and well age. S P E Prod Oper 28. <http://dx.doi.org/10.2118/166142-PA>

- [King, GE.](http://dx.doi.org/10.2118/133456-MS) (2010). Thirty years of gas shale fracturing: what have we learned? Society of Petroleum Engineers. <http://dx.doi.org/10.2118/133456-MS>
- [King, GE.](#) (2012). Hydraulic fracturing 101: What every representative, environmentalist, regulator, reporter, investor, university researcher, neighbor and engineer should know about estimating frac risk and improving frac performance in unconventional gas and oil wells. SPE Hydraulic Fracturing Technology Conference, February 6-8, 2012, The Woodlands, TX.
- [Kirksey, J.](#) (2013). Optimizing wellbore integrity in well construction. Presentation presented at North American Wellbore Integrity Workshop, October 16-17, 2013, Denver, CO.
- [Klein, M; Kenealey, G; Makowecki, B.](#) (2012). Comparison of hydraulic fracture fluids in multi-stage fracture stimulated horizontal wells in the Pembina Cardium formation. In 2012 SPE hydrocarbon economics and evaluation symposium. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/162916-MS>
- [Knappe, D; Fireline, JL.](#) (2012). Fracking 101: Shale gas extraction using horizontal drilling and hydraulic fracturing. Presentation presented at NCAWWA-WEA Annual Conference, November 14, 2012, Raleigh, NC.
- [Konikow, LF.](#) (2013a). Groundwater depletion in the United States (1900-2008): U.S. Geological Survey Scientific Investigations Report 2013-5079. Reston, VA: U.S. Geological Survey. <http://pubs.usgs.gov/sir/2013/5079>
- [Konikow, LF.](#) (2013b). Groundwater depletion in the United States (1900-2008). (USGS Scientific Investigations Report 2013). Reston, VA: U.S. Geological Survey. <http://pubs.usgs.gov/sir/2013/5079>
- [Konikow, LF; Kendy, E.](#) (2005). Groundwater depletion: A global problem. *Hydrogeo J* 13: 317-320. <http://dx.doi.org/10.1007/s10040-004-0411-8>
- [Korfmacher, KS; Jones, WA; Malone, SL; Vinci, LF.](#) (2013). Public health and high volume hydraulic fracturing. *New Solutions: A Journal of Environmental and Occupational Health Policy* 23: 13-31. <http://dx.doi.org/10.2190/NS.23.1.c>
- [Krasner, SW.](#) (2009). The formation and control of emerging disinfection by-products of health concern [Review]. *Philos Transact A Math Phys Eng Sci* 367: 4077-4095. <http://dx.doi.org/10.1098/rsta.2009.010>
- [Kundert, D; Mullen, M.](#) (2009). Proper evaluation of shale gas reservoirs leads to a more effective hydraulic-fracture stimulation. Paper presented at SPE Rocky Mountain Petroleum Technology Conference, April 14-16, 2009, Denver, CO.
- [Kuthnert, N; Werline, R; Nichols, K.](#) (2012). Water reuse and recycling in the oil and gas industry: Devons water management success. Presentation presented at 2nd Annual Texas Water Reuse Conference, July 20, 2012, Fort Worth, TX.
- [Kuwayama, Y; Olmstead, S; Krupnick, A.](#) (2015). Water quality and quantity impacts of hydraulic fracturing. *Current Sustainable/Renewable Energy Reports* 2: 17-24. <http://dx.doi.org/10.1007/s40518-014-0023-4>
- [LA Ground Water Resources Commission](#) (Louisiana Ground Water Resources Commission). (2012). *Managing Louisiana's Groundwater Resources: An interim report to the Louisiana Legislature*. Baton Rouge, LA: Louisiana Department of Natural Resources. <http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=907>
- [Lacazette, A; Geiser, P.](#) (2013). Comment on Davies et al., 2012 Hydraulic fractures: How far can they go? *Marine and Petroleum Geology* 43: 516-518. <http://dx.doi.org/10.1016/j.marpetgeo.2012.12.008>
- [Lange, T; Sauter, M; Heitfeld, M; Schetelig, K; Brosig, K; Jahnke, W; Kissinger, A; Helmig, R; Ebigbo, A; Class, H.](#) (2013). Hydraulic fracturing in unconventional gas reservoirs: risks in the geological system part 1. *Environmental Earth Sciences* 70: 3839-3853. <http://dx.doi.org/10.1007/s12665-013-2803-3>

- [Langmuir, D; Riese, AC.](#) (1985). THE THERMODYNAMIC PROPERTIES OF RADIUM. *Geochim Cosmo Acta* 49: 1593-1601.
- [Laurenzi, JJ; Jersey, GR.](#) (2013). Life cycle greenhouse gas emissions and freshwater consumption of Marcellus shale gas. *Environ Sci Technol* 47: 4896-4903. <http://dx.doi.org/10.1021/es305162w>
- [Lawal, H; Abolo, NU; Jackson, G; Sahai, V; Flores, C.](#) (2014). A quantitative approach to analyze fracture area loss in shale gas reservoirs. SPE Latin America and Caribbean Petroleum Engineering Conference, May 21-23, 2014, Maracaibo, Venezuela.
- [LDEQ](#) (Louisiana Department of Environmental Quality). (2008). Ground water use advisory: Commissioner of conservation recommends wise water use planning in the Haynesville Shale. <http://dnr.louisiana.gov/index.cfm?md=newsroom&tmp=detail&aid=509>
- [LEau LLC.](#) (2008). Dew vaporation desalination 5,000-gallon-per-day pilot plant. (Desalination and Water Purification Research and Development Program Report No. 120). Denver, CO: Bureau of Reclamation, U.S. Department of the Interior. <http://www.usbr.gov/research/AWT/reportpdfs/report120.pdf>
- [LeBas, R; Lord, P; Luna, D; Shahan, T.](#) (2013). Development and use of high-TDS recycled produced water for crosslinked-gel-based hydraulic fracturing. In 2013 SPE hydraulic fracturing technology conference. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/163824-MS>
- [Lecampion, B; Jeffrey, R; Detournay, E.](#) (2005). Resolving the geometry of hydraulic fractures from tilt measurements. *Pure Appl Geophys* 162: 2433-2452. <http://dx.doi.org/10.1007/s00024-005-2786-4>
- [Lee, DS; Herman, JD; Elsworth, D; Kim, HT; Lee, HS.](#) (2011). A critical evaluation of unconventional gas recovery from the marcellus shale, northeastern United States. *K S C E Journal of Civil Engineering* 15: 679-687. <http://dx.doi.org/10.1007/s12205-011-0008-4>
- [Lee, K; Neff, J.](#) (2011). Produced water: Environmental risks and advances in mitigation technologies. New York, NY: Springer. <http://dx.doi.org/10.1007/978-1-4614-0046-2>
- [Lefebvre, O; Moletta, R.](#) (2006). Treatment of organic pollution in industrial saline wastewater: a literature review [Review]. *Water Res* 40: 3671-3682. <http://dx.doi.org/10.1016/j.watres.2006.08.027>
- [LePage, J; De Wolf, C; Bemelaar, J; Nasr-El-din, HA.](#) (2013). An environmentally friendly stimulation fluid for high-temperature applications. *S P E Journal* 16: 104-110. <http://dx.doi.org/10.2118/121709-PA>
- [Levis, E.](#) (2011). Texas company pays \$93,710 settlement for polluting Clearfield County Creek. Pennsylvania Fish and Boat Commission. <https://www.fish.state.pa.us/newsreleases/2011press/eog-settlement.htm>
- [Linarić, M; Markić, M; Sipos, L.](#) (2013). High salinity wastewater treatment. *Water Sci Technol* 68: 1400-1405. <http://dx.doi.org/10.2166/wst.2013.376>
- [Linkov, I; Welle, P; Loney, D; Tkachuk, A; Canis, L; Kim, JB; Bridges, T.](#) (2011). Use of multicriteria decision analysis to support weight of evidence evaluation. *Risk Anal* 31: 1211-1225. <http://dx.doi.org/10.1111/j.1539-6924.2011.01585.x>
- [Llewellyn, GT.](#) (2014). Evidence and mechanisms for Appalachian Basin brine migration to shallow aquifers in NE Pennsylvania, USA. *Hydrogeo J* 22: 1055-1066. <http://dx.doi.org/10.1007/s10040-014-1125-1>
- [Lowe, T; Potts, M; Wood, D.](#) (2013). A case history of comprehensive hydraulic fracturing monitoring in the Cana Woodford. In 2013 SPE annual technical conference and exhibition. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/166295-MS>
- [Lustgarten, A.](#) (2009). Frack fluid spill in Dimock contaminates stream, killing fish. Available online at <http://www.propublica.org/article/frack-fluid-spill-in-dimock-contaminates-stream-killing-fish-921>
- [Lutz, BD; Lewis, AN; Doyle, MW.](#) (2013). Generation, transport, and disposal of wastewater associated with Marcellus Shale gas development. *Water Resour Res* 49: 647-656.

- [Ma, G; Geza, M; Xu, P.](#) (2014). Review of flowback and produced water management, treatment, and beneficial use for major shale gas development basins. Shale Energy Engineering Conference 2014, Pittsburgh, Pennsylvania, United States.
- [MacDonald, RJ; Frantz, JH; Schlotterbeck, ST; Adams, B; Sikorski, D.](#) (2003). An update of recent production responses obtained from Devonian shale and Berea wells stimulated with nitrogen foam (with proppant) vs. nitrogen-only, Pike Co., KY. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/84834-MS>
- [Malone, M; Ely, JW.](#) (2007). Execution of hydraulic fracturing treatments. In M Economides; T Martin (Eds.), Modern fracturing: enhancing natural gas production (pp. 323-360). Houston, TX: ET Publishing.
- [Malone, S; Kelso, M; Auch, T; Edelstein, K; Ferrar, K; Jalbert, K.](#) (2015). Data inconsistencies from states with unconventional oil and gas activity. J Environ Sci Health A Tox Hazard Subst Environ Eng 50: 501-510. <http://dx.doi.org/10.1080/10934529.2015.992678>
- [Maloney, KO; Yoxtheimer, DA.](#) (2012). Production and disposal of waste materials from gas and oil extraction from the Marcellus shale play in Pennsylvania. Environmental Practice 14: 278-287. <http://dx.doi.org/10.1017/S146604661200035X>
- [Mantell, ME.](#) (2011). Produced water reuse and recycling challenges and opportunities across major shale plays. Presentation presented at Hydraulic Fracturing Study: March 2011 Technical Workshop #4 on Water Resources Management, March 29-30, 2011, Arlington, VA.
- [Mantell, ME.](#) (2013a). Recycling and reuse of produced water to reduce freshwater use in hydraulic fracturing operations. Presentation presented at Water acquisition modeling: Assessing impacts through modeling and other means Technical workshop on wastewater treatment and related modeling, June 4, 2013, Arlington, VA.
- [Mantell, ME.](#) (2013b). Recycling and reuse of produced water to reduce freshwater use in hydraulic fracturing operations. In Summary of the technical workshop on water acquisition modeling: Assessing impacts through modeling and other means (pp. A20-A27). Washington, D.C.: U.S. Environmental Protection Agency. <http://www2.epa.gov/hfstudy/summary-technical-workshop-water-acquisition-modeling-assessing-impacts-through-modeling-and>
- [Marshak, S.](#) (2004). Essentials of geology (1st ed.). New York, NY: W.W. Norton and Company.
- [Martin, T; Valko, P.](#) (2007). Hydraulic fracture design for production enhancement. In M Economides; T Martin (Eds.), Modern fracturing enhancing natural gas production. Houston, TX: ET Publishing.
- [Matthews, IC; Li, S; Swann, CT; Ericksen, RL.](#) (2006). Incubation with moist top soils enhances solubilization of radium and other components from oilfield scale and sludge: Environmental concerns from Mississippi. Environmental Geosciences 13: 43-53.
- [Maule, AL; Makey, CM; Benson, EB; Burrows, JI; Scammell, MK.](#) (2013). Disclosure of hydraulic fracturing fluid chemical additives: analysis of regulations. New Solutions: A Journal of Environmental and Occupational Health Policy 23: 167-187. <http://dx.doi.org/10.2190/NS.23.1.j>
- [Maupin, MA; Kenny, JF; Hutson, SS; Lovelace, JK; Barber, NL; Linsey, KS.](#) (2014). Estimated use of water in the United States in 2010. (USGS Circular 1405). Reston, VA: U.S. Geological Survey. <http://dx.doi.org/10.3133/cir1405>
- [McDaniel, J; Watters, L; Shadravan, A.](#) (2014). Cement sheath durability: Increasing cement sheath integrity to reduce gas migration in the Marcellus Shale Play. In SPE hydraulic fracturing technology conference proceedings. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/168650-MS>
- [McElreath, D.](#) (2011). Comparison of hydraulic fracturing fluids composition with produced formation water following fracturing Implications for fate and transport. Presentation presented at Hydraulic Fracturing Study: March 2011 Technical Workshop on Fate and Transport, March 28-29, 2011, Arlington, VA.

- [McIntosh, JC; Walter, LM.](#) (2005). Volumetrically significant recharge of Pleistocene glacial meltwaters into epicratonic basins: Constraints imposed by solute mass balances. *Chem Geol* 222: 292-309. <http://dx.doi.org/10.1016/j.chemgeo.2005.07.010>
- [McIntosh, JC; Walter, LM; Martini, AM.](#) (2002). Pleistocene recharge to midcontinent basins: effects on salinity structure and microbial gas generation. *Geochim Cosmo Acta* 66: 1681-1700. [http://dx.doi.org/10.1016/S0016-7037\(01\)00885-7](http://dx.doi.org/10.1016/S0016-7037(01)00885-7)
- [McKay, SF; King, AJ.](#) (2006). Potential ecological effects of water extraction in small, unregulated streams. *River Research and Applications* 22: 1023-1037. <http://dx.doi.org/10.1002/rra.958>
- [McKenzie, LM; Guo, R; Witter, RZ; Savitz, DA; Newman, L; Adgate, JL.](#) (2014). Birth outcomes and maternal residential proximity to natural gas development in rural Colorado. *Environ Health Perspect* 122: 412-417. <http://dx.doi.org/10.1289/ehp.1306722>
- [MCOR](#) (Marcellus Center for Outreach and Research). (2012). Extent and thickness of Marcellus Shale. University Park, PA: Pennsylvania State University. Retrieved from http://www.marcellus.psu.edu/images/Marcellus_thickness.gif
- [Methanol Institute.](#) (2013). Methanol safe handling manual. Alexandria, VA. <http://www.methanol.org/Health-And-Safety/Safe-Handling/Methanol-Safe-Hanlding-Manual.aspx>
- [Michie, TW; Koch, CA.](#) (1991). Evaluation of injection-well risk management in the Williston Basin. *J Pet Tech* 43: 737-741. <http://dx.doi.org/10.2118/20693-PA>
- [Minnich, K.](#) (2011). A water chemistry perspective on flowback reuse with several case studies. Minnich, K. http://www2.epa.gov/sites/production/files/documents/10_Minnich_-_Chemistry_508.pdf
- [Miskimins, JL.](#) (2008). Design and life cycle considerations for unconventional reservoir wells. In 2008 SPE Unconventional Reservoirs Conference. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/114170-MS>
- [Mitchell, AL; Small, M; Casman, EA.](#) (2013a). Surface water withdrawals for Marcellus Shale gas development: performance of alternative regulatory approaches in the Upper Ohio River Basin. *Environ Sci Technol* 47: 12669-12678. <http://dx.doi.org/10.1021/es403537z>
- [Mitchell, BJ.](#) (1970) Viscosity of foam. (Doctoral Dissertation). The University of Oklahoma,
- [Mitchell, J; Pabon, P; Collier, ZA; Egeghy, PP; Cohen-Hubal, E; Linkov, I; Vallerio, DA.](#) (2013b). A decision analytic approach to exposure-based chemical prioritization. *PLoS ONE* 8: e70911. <http://dx.doi.org/1371/journal.pone.0070911>
- [Molofsky, LJ; Connor, JA; Wylie, AS; Wagner, T; Farhat, SK.](#) (2013). Evaluation of methane sources in groundwater in northeastern Pennsylvania. *Ground Water* 51: 333-349. <http://dx.doi.org/10.1111/gwat.12056>
- [Montana GWIC](#) (Montana Ground Water Information Center). (2009). Coal bed methane powder river basin: Montana Bureau of Mines and Geology Ground Water Information Center. Butte, MT.
- [Montgomery, C.](#) (2013). Fracturing fluid components. In A Bunder; J McLennon; R Jeffrey (Eds.), *Effective and Sustainable Hydraulic Fracturing*. Croatia: InTech. <http://dx.doi.org/10.5772/56422>
- [Montgomery, CT; Smith, MB.](#) (2010). Hydraulic fracturing - History of an enduring technology. *J Pet Tech* 62: 26-32.
- [Morillon, A; Vidalie, JF; Syahnudi, U; Suripno, S; Hadinoto, EK.](#) (2002). Drilling and waste management; SPE 73931. Presentation presented at The SPE International Conference on Health, Safety, and Environment in Oil and Gas Exploration and Production, March 20-22, 2002, Kuala Lumpur, Malaysia.
- [Moudgal, CI; Venkatapathy, R; Choudhury, H; Bruce, RM; Lipscomb, JC.](#) (2003). Application of QSTRs in the selection of a surrogate toxicity value for chemical of concern. *Environ Sci Technol* 37: 5228-5235.

- [Mouser, P; Liu, S; Cluff, M; McHugh, M; Lenhart, J; MacRae, J.](#) (In Press) Biodegradation of hydraulic fracturing fluid organic additives in sediment-groundwater microcosms.
- [Muehlenbachs, L; Spiller, E; Timmins, C.](#) (2012). Shale gas development and property values: Differences across drinking water sources. (NBER Working Paper No. 18390). Cambridge, MA: National Bureau of Economic Research. <http://www.nber.org/papers/w18390>
- [Mukherjee, H; Poe jr., B; Heidt, J; Watson, T; Barree, R.](#) (2000). Effect of pressure depletion on fracture-geometry evolution and production performance. SPE Prod Facil 15: 144-150. <http://dx.doi.org/10.2118/65064-PA>
- [Murali Mohan, A; Hartsock, A; Hammack, RW; Vidic, RD; Gregory, KB.](#) (2013). Microbial communities in flowback water impoundments from hydraulic fracturing for recovery of shale gas. FEMS Microbiol Ecol. <http://dx.doi.org/10.1111/1574-6941.12183>
- [Murdoch, PS; Baron, JS; Miller, TL.](#) (2000). Potential effects of climate change on surface-water quality in North America. J Am Water Resour Assoc 36: 347-366.
- [Murray, KE.](#) (2013). State-scale perspective on water use and production associated with oil and gas operations, Oklahoma, U.S. Environ Sci Technol 47: 4918-4925. <http://dx.doi.org/10.1021/es4000593>
- [Myers, T.](#) (2012a). Author's reply. Ground Water 50: 828-830. <http://dx.doi.org/10.1111/j.1745-6584.2012.00991.x>
- [Myers, T.](#) (2012b). Potential contaminant pathways from hydraulically fractured shale to aquifers. Ground Water 50: 872-882. <http://dx.doi.org/10.1111/j.1745-6584.2012.00933.x>
- [Myers, T.](#) (2013). Author's reply for comments on potential contaminant pathways from hydraulically fractured shale to aquifers' [Comment]. Ground Water 51: 319321. <http://dx.doi.org/10.1111/gwat.12016>
- [National Drought Mitigation Center.](#) (2015). U.S. drought monitor. Available online at <http://droughtmonitor.unl.edu/Home.aspx> (accessed February 27, 2015).
- [Neff, JM.](#) (2002). Bioaccumulation in marine organisms: Effect of contaminants from oil well produced water. Amsterdam: Elsevier.
- [Nelson, AW; May, D; Knight, AW; Eitrheim, ES; Mehrhoff, M; Shannon, R; Litman, R; Schultz, MK.](#) (2014). Matrix complications in the determination of radium levels in hydraulic fracturing flowback water from Marcellus Shale. 1: 204-208. <http://dx.doi.org/10.1021/ez5000379>
- [NETL \(National Energy Technology Laboratory\).](#) (2013). Modern shale gas development in the United States: An update. Pittsburgh, PA: U.S. Department of Energy. National Energy Technology Laboratory. <http://www.netl.doe.gov/File%20Library/Research/Oil-Gas/shale-gas-primer-update-2013.pdf>
- [NETL \(National Energy Technology Laboratory\).](#) (2014). Evaporation [Fact Sheet]. Pittsburgh, PA: US Department of Energy. <http://www.netl.doe.gov/research/coal/crosscutting/pwmmis/tech-desc/evap>
- [New Mexico Bureau of Mines and Mineral Resources.](#) (1994). Coalbed methane in the upper cretaceous fruitland formation, San Juan Basin, New Mexico and Colorado. Socorro, NM: New Mexico Bureau of Mines and Mineral Resources, New Mexico Institute of Mining and Technology. <https://geoinfo.nmt.edu/publications/monographs/bulletins/146/>
- [Newell, R.](#) (2011). Shale gas and the outlook for U.S. natural gas markets and global gas resources. Presentation presented at US EIA presentation at OECD Meetings, June 21, 2011, Paris, France.

- [Nicot, JP; Hebel, AK; Ritter, SM; Walden, S; Baier, R; Galusky, P; Beach, J; Kyle, R; Symank, L; Breton, C.](#) (2011). Current and projected water use in the Texas mining and oil and gas industry - Final Report. (TWDB Contract No. 0904830939). Nicot, JP; Hebel, AK; Ritter, SM; Walden, S; Baier, R; Galusky, P; Beach, J; Kyle, R; Symank, L; Breton, C.
http://www.twdb.texas.gov/publications/reports/contracted_reports/doc/0904830939_MiningWaterUse.pdf
- [Nicot, JP; Reedy, RC; Costley, RA; Huang, Y.](#) (2012). Oil & gas water use in Texas: Update to the 2011 mining water use report. Nicot, JP; Reedy, RC; Costley, RA; Huang, Y.
http://www.twdb.state.tx.us/publications/reports/contracted_reports/doc/0904830939_2012Update_MiningWaterUse.pdf
- [Nicot, JP; Scanlon, BR.](#) (2012). Water use for shale-gas production in Texas, U.S. Environ Sci Technol 46: 3580-3586. <http://dx.doi.org/10.1021/es204602t>
- [Nicot, JP; Scanlon, BR; Reedy, RC; Costley, RA.](#) (2014). Source and fate of hydraulic fracturing water in the Barnett Shale: a historical perspective. Environ Sci Technol 48: 2464-2471.
<http://dx.doi.org/10.1021/es404050r>
- [NM OSE](#) (New Mexico Office of the State Engineer). (2013). New Mexico water use by categories 2010. (Technical Report 54). Santa Fe, NM: New Mexico Office of the State Engineer, Water Use and Conservation Bureau.
<http://www.ose.state.nm.us/Pub/TechnicalReports/TechReport%2054NM%20Water%20Use%20by%20Categories%20.pdf>
- [North Dakota Department of Health.](#) (2015). Oil field environmental incident summary, incident 20150107160242. Available online at
http://www.ndhealth.gov/EHS/FOIA/Spills/Summary_Reports/20150107160242_Summary_Report.pdf
- [North Dakota Department of Mineral Resources.](#) (2013). North Dakota Department of Mineral Resources: Government Finance Interim Committee 12/12/2013. Presentation presented at Department of Mineral Resources: Update on the Status of Oil and Gas Development in the State, 12/12/2013, Bismarck, ND.
- [North Dakota State Water Commission.](#) (2010). Water appropriation requirements, current water use, & water availability for energy industries in North Dakota: a 2010 summary. Bismarck, ND.
<http://www.swc.nd.gov/4dlink9/4dcgi/GetContentPDF/PB-1800/W&E%20RPT%20FinalR.pdf>
- [North Dakota State Water Commission.](#) (2014). Facts about North Dakota fracking and water use. Bismarck, ND. <http://www.swc.nd.gov/4dlink9/4dcgi/GetContentPDF/PB-2419/Fact%20Sheet.pdf>
- [Nowak, N; Bradish, J.](#) (2010). High density polyethylene (HDPE) lined produced water evaporation ponds. Presentation presented at 17th International Petroleum and Biofuels Environmental Conference, August 31-September 2, 2010, San Antonio, TX.
- [NPC](#) (National Petroleum Council). (2011a). Management of produced water from oil and gas wells. (Paper #2-17). Washington, DC. http://www.npc.org/Prudent_Development-Topic_Papers/2-17_Management_of_Produced_Water_Paper.pdf
- [NPC](#) (National Petroleum Council). (2011b). Plugging and abandonment of oil and gas wells. (Paper #2-25). Washington, DC: National Petroleum Council (NPC).
- [NRC](#) (National Research Council). (2010). Management and effects of coalbed methane produced water in the western United States. Washington, DC: National Academies Press.
http://www.nap.edu/catalog.php?record_id=12915
- [NRC](#) (National Research Council). (2012). Water reuse: Potential for expanding the nations water supply through reuse of municipal wastewater. Committee on the Assessment of Water Reuse as an Approach for Meeting Future Water Supply Need. Washington, DC: The National Academies Press.
http://www.nap.edu/openbook.php?record_id=13303

- NRC (National Research Council). (2014). A framework to guide selection of chemical alternatives. Washington, D.C.: The National Academies Press. <http://www.nap.edu/catalog/18872/a-framework-to-guide-selection-of-chemical-alternatives>
- NSTC (National Science and Technology Council). (2000). Integrated assessment of hypoxia in the Northern Gulf of Mexico. Washington, DC: U.S. National Science and Technology Council, Committee on Environment and Natural Resources. http://oceanservice.noaa.gov/products/hypox_final.pdf
- NYSDEC (New York State Department of Environmental Conservation). (2011). Revised draft supplemental generic environmental impact statement (SGEIS) on the oil, gas and solution mining regulatory program: Well permit issuance for horizontal drilling and high-volume hydraulic fracturing to develop the Marcellus shale and other low-permeability gas reservoirs. Albany, NY: NY SDEC. <http://www.dec.ny.gov/energy/75370.html>
- ODNR, DMRM, (Ohio Department of Natural Resources, Division of Mineral Resources Management). (2008). Report on the investigation of the natural gas invasion of aquifers in Bainbridge Township of Geauga County, Ohio. Columbus, OH: ODNR. <http://oilandgas.ohiodnr.gov/portals/oilgas/pdf/bainbridge/report.pdf>
- Ohio EPA (Ohio Environmental Protection Agency). (2012a). Considerations for public water systems prior to providing raw or treated water to oil and natural gas companies. <http://www.epa.state.oh.us/Portals/0/general%20pdfs/Considerations%20for%20Public%20Water%20Systems%20Prior%20to%20Providing%20Raw%20or%20Treated%20Water%20to%20Oil%20and%20Natural%20Gas%20Companies.pdf>
- Ohio EPA (Ohio Environmental Protection Agency). (2012b). Ohios regulations: a guide for operators drilling in the Marcellus and Utica Shales. Columbus, OH. <http://www.epa.state.oh.us/Portals/0/general%20pdfs/Ohio%20Regulations%20-%20A%20Guide%20for%20Operators%20Drilling%20in%20the%20Marcellus%20and%20Utica%20Shales.pdf>
- Oil and Gas Mineral Services. (2010). MineralWise: Oil and gas terminology. Available online at <http://www.mineralweb.com/library/oil-and-gas-terms/>
- Olawoyin, R; Wang, JY; Oyewole, SA. (2013). Environmental safety assessment of drilling operations in the Marcellus-shale gas development. S P E Drilling & Completion 28: 212-220. <http://dx.doi.org/10.2118/163095-PA>
- Olmstead, SM; Muehlenbachs, LA; Shih, JS; Chu, Z; Krupnick, AJ. (2013). Shale gas development impacts on surface water quality in Pennsylvania. PNAS 110: 4962-4967. <http://dx.doi.org/10.1073/pnas.1213871110>
- Olson, JE. (2011). Hydraulic fracturing overview. Presentation presented at Summer Institute B: Energy, Climate and Water in the 21st Century, TXESS Revolution, Texas Earth and Space Science Revolution Professional Development for Educators, June, 2011, Austin, TX.
- Olsson, O; Weichgrebe, D; Rosenwinkel, KH. (2013). Hydraulic fracturing wastewater in Germany: composition, treatment, concerns. Environmental Earth Sciences 70: 3895-3906. <http://dx.doi.org/10.1007/s12665-013-2535-4>
- OMB (U.S. Office of Management and Budget). (2004). Final information quality bulletin for peer review. Washington, DC: US Office of Management and Budget (OMB). <http://www.whitehouse.gov/sites/default/files/omb/assets/omb/memoranda/fy2005/m05-03.pdf>
- Orem, W; Tatu, C; Varonka, M; Lerch, H; Bates, A; Engle, M; Crosby, L; Mcintosh, J. (2014). Organic substances in produced and formation water from unconventional natural gas extraction in coal and shale. Int J Coal Geol 126: 20-31. <http://dx.doi.org/10.1016/j.coal.2014.01.003>

- [Orem, WH; Tatu, CA; Lerch, HE; Rice, CA; Bartos, TT; Bates, AL; Tewalt, S; Corum, MD.](#) (2007). Organic compounds in produced waters from coalbed natural gas wells in the Powder River Basin, Wyoming, USA. *Appl Geochem* 22: 2240-2256. <http://dx.doi.org/10.1016/j.apgeochem.2007.04.010>
- [Osborn, SG; Vengosh, A; Warner, NR; Jackson, RB.](#) (2011). Methane contamination of drinking water accompanying gas-well drilling and hydraulic fracturing. *PNAS* 108: 8172-8176. <http://dx.doi.org/10.1073/pnas.1100682108>
- [OSHA](#) (Occupational Safety & Health Administration). (2014a). Personal communication: email exchanges between Tandy Zitkus, OSHA and Rebecca Daiss, U.S. EPA. Available online
- [OSHA](#) (Occupational Safety & Health Administration). (2014b). Personal communication: phone conversation between Tandy Zitkus, OSHA and Rebecca Daiss, U.S. EPA. Available online
- [OSHA](#) (Occupational Safety & Health Administration). (2015). Oil and gas well drilling and servicing etool: Well completion. Available online at https://www.osha.gov/SLTC/etools/oilandgas/well_completion/well_completion.html
- [Otton, JK; Zielinski, RA; Smith, BD; Abbott, MM.](#) (2007). Geologic controls on movement of produced-water releases at US geological survey research Site A, Skiatook lake, Osage county, Oklahoma. *Appl Geochem* 22: 2138-2154. <http://dx.doi.org/10.1016/j.apgeochem.2007.04.015>
- [OWRB](#) (Oklahoma Water Resources Board). (2014). The Oklahoma comprehensive water plan. Available online at <http://www.owrb.ok.gov/supply/ocwp/ocwp.php>
- [PA DCNR](#) (Pennsylvania Department of Conservation and Natural Resources). (2015). Thermal maturation and petroleum generation. Available online at http://www.dcnr.state.pa.us/topogeo/econresource/oilandgas/marcellus/sourcerock_index/sourcerock_maturation/index.htm (accessed April 9, 2015).
- [PA DEP](#) (Pennsylvania Department of Environmental Protection). (2000). Pennsylvania's plan for addressing problem abandoned wells and orphaned wells. Harrisburg, PA: PADEP.
- [PA DEP](#) (Pennsylvania Department of Environmental Protection). (2009a). Inspection Report, inspection record #1835041, enforcement record #251134. Harrisburg, PA: Commonwealth of Pennsylvania Department of Environmental Protection, Oil and Gas Management Program.
- [PA DEP](#) (Pennsylvania Department of Environmental Protection). (2009b). Stray natural gas migration associated with oil and gas wells [draft report]. Harrisburg, PA. http://www.dep.state.pa.us/dep/subject/advcoun/oil_gas/2009/Stray%20Gas%20Migration%20Cases.pdf
- [PA DEP](#) (Pennsylvania Department of Environmental Protection). (2010). DEP Fines Atlas Resources for drilling wastewater spill in Washington County. Available online at <http://www.portal.state.pa.us/portal/server.pt/community/newsroom/14287?id=13595&typeid=1> (accessed February 13, 2014).
- [PA DEP](#) (Pennsylvania Department of Environmental Protection). (2011a). Letter from Pennsylvania Department of the Environment to US EPA Region 3 Administrator Shawn Garvin. Available online at http://www.epa.gov/region3/marcellus_shale?#inforeqsbypadep
- [PA DEP.](#) [Road-spreading of brine for dust control and road stabilization, 43 Pa.B. 7377 § 78.70](#) (2011b). <http://www.pabulletin.com/secure/data/vol43/43-50/2362b.html>
- [PA DEP](#) (Pennsylvania Department of Environmental Protection). (2011c). Surface water sample analytical results from XTO 308 response data from XTO February 3, 2011 CAWP addendum. Indiana, PA: XTO Energy.

- [PA DEP](#) (Pennsylvania Department of Environmental Protection). (2015a). PA DEP oil & gas reporting website, statewide data downloads by reporting period. waste and production files downloaded for Marcellus/unconventional wells, July 2009 December 2014. Harrisburg, PA. Retrieved from <https://www.paoilandgasreporting.state.pa.us/publicreports/Modules/DataExports/DataExports.aspx>
- [PA DEP](#) (Pennsylvania Department of Environmental Protection). (2015b). Technologically enhanced naturally occurring radioactive materials (TENORM) study report. Harrisburg, PA. <http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-105822/PA-DEP-TENORM-Study Report Rev. 0 01-15-2015.pdf>
- [Palmer, ID; Moschovidis, ZA; Cameron, JR.](#) (2005). Coal failure and consequences for coalbed methane wells. Paper presented at SPE annual technical conference and exhibition, October 9-12, 2005, Dallas, TX.
- [Papoulias, DM; Velasco, AL.](#) (2013). Histopathological analysis of fish from Acorn Fork Creek, Kentucky, exposed to hydraulic fracturing fluid releases. *Southeastern Naturalist* 12: 92-111.
- [Parker, KM; Zeng, T; Harkness, J; Vengosh, A; Mitch, WA.](#) (2014). Enhanced formation of disinfection byproducts in shale gas wastewater-impacted drinking water supplies. *Environ Sci Technol* 48: 11161-11169. <http://dx.doi.org/10.1021/es5028184>
- [Pashin, JC; McIntyre-Redden, MR; Mann, SD; Kopaska-Merkel, DC; Varonka, M; Orem, W.](#) (2014). Relationships between water and gas chemistry in mature coalbed methane reservoirs of the Black Warrior Basin. *Int J Coal Geol* 126: 92-105. <http://dx.doi.org/10.1016/j.coal.2013.10.002>
- [Patel, PS; Robart, CJ; Ruegamer, M; Yang, A.](#) (2014). Analysis of US hydraulic fracturing fluid system and proppant trends. In 2014 SPE hydraulic fracturing technology conference. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/168645-MS>
- [Pattera, P.](#) (2011). DEP shuts down Tri-County Waste Water over illegal dumping. Available online at http://triblive.com/x/pittsburghtrib/news/regional/s_728516.html#axzz3UCvkvM7t (accessed March 12, 2015).
- [Patzek, TW; Male, F; Marder, M.](#) (2013). Gas production in the Barnett Shale obeys a simple scaling theory. *PNAS* 110: 19731-19736. <http://dx.doi.org/10.1073/pnas.1313380110>
- [Pearson, CM; Griffin, L; Wright, CA; Weijers, L.](#) (2013). Breaking up is hard to do: creating hydraulic fracture complexity in the Bakken central basin. In 2013 SPE hydraulic fracturing technology conference. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/163827-MS>
- [Pearson, K.](#) (2011). Geologic models and evaluation of undiscovered conventional and continuous oil and gas resources Upper Cretaceous Austin Chalk, U.S. Gulf Coast. In US Geological Survey Scientific Investigations Report. (20125159). U.S. Geological Survey. <http://pubs.usgs.gov/sir/2012/5159/>
- [Penttila, B; Heine, L; Craft, E.](#) (2013). Manuscript in preparation assessing the hazard data gap for hydraulic fracturing chemicals. Penttila, B; Heine, L; Craft, E.
- [Peraki, M; Ghazanfari, E.](#) (2014). Electrodialysis treatment of flow-back water for environmental protection in shale gas development. In Shale gas development Shale energy engineering 2014. Reston, VA: American Society of Civil Engineers. <http://dx.doi.org/10.1061/9780784413654.008>
- [Peterman, ZE; Thamke, J; Futa, K; Oliver, T.](#) (2012). Strontium isotope evolution of produced water in the East Poplar Oil Field, Montana. Presentation presented at US Geological Survey AAPG annual convention and exhibition, April 23, 2012, Long Beach, California.
- [Phillips, A.](#) (2014). Frackers spill olympic pools worth of hydrochloric acid in Oklahoma. Available online at <http://thinkprogress.org/climate/2014/07/31/3466283/olympic-pool-sized-hydrochloric-acid-spill-oklahoma/>
- [Pinder, GF; Celia, MA.](#) (2006). Subsurface hydrology. Hoboken, NJ: John Wiley & Sons, Inc. <http://dx.doi.org/10.1002/0470044209>

- [Pinder, GF; Gray, WG.](#) (2008). Essentials of multiphase flow and transport in porous media. Hoboken, NJ: John Wiley & Sons.
- [Plumlee, MH; Debroux, JF; Taffler, D; Graydon, JW; Mayer, X; Dahm, KG; Hancock, NT; Guerra, KL; Xu, P; Drewes, JE; Cath, TY.](#) (2014). Coalbed methane produced water screening tool for treatment technology and beneficial use. 5: 22-34. <http://dx.doi.org/10.1016/j.juogr.2013.12.002>
- [Plummer, M; Wood, T; Huang, H; Guo, L; Reiten, J; Chandler, K; Metesh, I.](#) (2013). Water needs and availability for hydraulic fracturing in the Bakken formation, eastern Montana. Presentation presented at 2013 Technical Workshop, Water Acquisition Modeling: Assessing Impacts Through Modeling and Other Means, June 4, 2013, Arlington, VA.
- [Porcelli, D; Kim, CK; Martin, P; Moore, WS; Phaneuf, M.](#) (2014). Properties of radium. In The environmental behaviour of radium: revised edition. Vienna, Austria: International Atomic Energy Agency. http://www-pub.iaea.org/MTCD/Publications/PDF/trs476_web.pdf
- [Powell, B.](#) (2013). Secondary containment: regulations and best management practices in the Appalachian Basin. (AADE-13-FTCE-18). Houston, Texas: American Association of Drilling Engineers.
- [Powers, SE; Hunt, CS; Heermann, SE; Corseuil, HX; Rice, D; Alvarez, PJJ.](#) (2001). The transport and fate of ethanol BTEX in groundwater contaminated by gasohol. Environ Sci Technol 31: 79-123. <http://dx.doi.org/10.1080/20016491089181>
- [Purestream](#) (Purestream Services). (2013). Purestream services will begin commercial operations to treat Eagle Ford Shale produced and frac flow-back water in Gonzalez County, Texas. Retrieved from <http://purestreamtechnology.com/index.php/component/content/article/72-press-releases/206-purestream-services-will-begin-commercial-operations-to-treat-eagle-ford-shale-produced-and-frac-flow-back-water-in-gonzalez-county-texas>
- [Rahm, BG; Bates, JT; Bertoia, LR; Galford, AE; Yoxtheimer, DA; Riha, SJ.](#) (2013). Wastewater management and Marcellus Shale gas development: trends, drivers, and planning implications. J Environ Manage 120: 105-113. <http://dx.doi.org/10.1016/j.jenvman.2013.02.029>
- [Rahm, BG; Riha, SJ.](#) (2012). Toward strategic management of shale gas development: Regional, collective impacts on water resources. Environ Sci Pol 17: 12-23. <http://dx.doi.org/10.1016/j.envsci.2011.12.004>
- [Rahm, BG; Riha, SJ.](#) (2014). Evolving shale gas management: water resource risks, impacts, and lessons learned [Review]. Environ Sci Process Impacts 16: 1400-1412. <http://dx.doi.org/10.1039/c4em00018h>
- [Rahm, BG; Vedachalam, S; Bertoia, LR; Mehta, D; Vanka, VS; Riha, SJ.](#) (2015). Shale gas operator violations in the Marcellus and what they tell us about water resource risks. Energy Policy 82: 1-11. <http://dx.doi.org/10.1016/j.enpol.2015.02.033>
- [Ramirez, P.](#) (2002). Oil field produced water discharges into wetlands in Wyoming. (97-6- 6F34). Cheyenne, WY: U.S. Fish and Wildlife Service. <http://www.fws.gov/mountain-prairie/contaminants/papers/r6718c02.pdf>
- [Rasa, E; Bekins, BA; Mackay, DM; de Sieyes, NR; Wilson, JT; Feris, KP; Wood, IA; Scow, KM.](#) (2013). Impacts of an ethanol-blended fuel release on groundwater and fate of produced methane: Simulation of field observations. Water Resour Res 49: 4907-4926. <http://dx.doi.org/10.1002/wrcr.20382>
- [Rassenfoss, S.](#) (2011). From flowback to fracturing: Water recycling grows in the Marcellus shale. J Pet Tech 63: 48-51.
- [Reagan, MT; Moridis, GJ; Johnson, JN; Keen, ND.](#) (2015). Numerical simulation of the environmental impact of hydraulic fracturing of tight/shale gas reservoirs on near-surface groundwater: background, base cases, shallow reservoirs, short-term gas and water transport. Water Resour Res 51: 1-31. <http://dx.doi.org/10.1002/2014WR016086>

- [Renpu, W.](#) (2011). Advanced well completion engineering (Third ed.). Houston, TX: Gulf Professional Publishing.
- [Repetski, JE; Ryder, RT; Weary, DJ; Harris, AG; Trippie, MH.](#) (2008). Thermal maturity patterns (CAI and %Ro) in upper ordovician and devonian rocks of the Appalachian Basin: A major revision of USGS map I917E using new subsurface collections. U.S. Geological Survey. <http://pubs.usgs.gov/sim/3006/SIM3006.pdf>
- [Resnikoff, M; Alexandrova, E; Travers, I.](#) (2010). Radioactivity in Marcellus shale: Report prepared for Residents for the Preservation of Lowman and Chemung (RFPLC). New York, NY: Radioactive Waste Management Associates.
- [Reuters.](#) (2014). UPDATE 2-oil well in North Dakota out of control, leaking. Available online at <http://www.reuters.com/article/2014/02/14/energy-crude-blowout-idUSL2N0LJ15820140214> (accessed March 2, 2015).
- [Révész, KM; Breen, KJ; Baldassare, AJ; Burruss, RC.](#) (2012). Carbon and hydrogen isotopic evidence for the origin of combustible gases in water-supply wells in north-central Pennsylvania. Appl Geochem 27: 361-375. <http://dx.doi.org/10.1016/j.apgeochem.2011.12.002>
- [Reynolds, RR; Kiker, RD.](#) (2003). Produced water and associated issues a manual for the independent operator. (Oklahoma Geological Survey Open-File Report 6-2003). Tulsa, OK: Oklahoma Geological Survey. http://karl.nrcce.wvu.edu/regional/pww/produced_water.pdf
- [Rice, CA.](#) (1999). Waters co-produced with coal-bed methane from the Ferron Sandstone in east central Utah: chemical and isotopic composition, volumes, and impacts of disposal [Abstract]. Geological Society of America Abstracts with Programs 31: A385.
- [Rice, CA; Ellis, MS; Bullock, JH.](#) (2000). Water co-produced with coalbed methane in the Powder River basin, Wyoming: Preliminary compositional data. (Open File-Report 00-372). Denver, CO: U.S. Department of the Interior, U.S. Geological Survey.
- [Rich, AL; Crosby, EC.](#) (2013). Analysis of reserve pit sludge from unconventional natural gas hydraulic fracturing and drilling operations for the presence of technologically enhanced naturally occurring radioactive material (TENORM). New Solutions: A Journal of Environmental and Occupational Health Policy 23: 117-135. <http://dx.doi.org/10.2190/NS.23.1.h>
- [Richardson, SD; Plewa, MJ; Wagner, ED; Schoeny, R; Demarini, DM.](#) (2007). Occurrence, genotoxicity, and carcinogenicity of regulated and emerging disinfection by-products in drinking water: A review and roadmap for research [Review]. Mutat Res 636: 178-242. <http://dx.doi.org/10.1016/j.mrrev.2007.09.00>
- [Rickman, R; Mullen, MJ; Petre, JE; Grieser, WV; Kundert, D.](#) (2008). A practical use of shale petrophysics for stimulation design optimization: all shale plays are not clones of the Barnett shale. In 2008 SPE annual technical conference & exhibition. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/115258-MS>
- [Richter, BC; Kreitler, CW.](#) (1993). Geochemical techniques for identifying sources of ground-water salinization. Boca Raton, FL: CRC Press. <http://www.crcpress.com/product/isbn/9781566700009>
- [Rivett, MO; Wealthall, GP; Dearden, RA; McAlary, TA.](#) (2011). Review of unsaturated-zone transport and attenuation of volatile organic compound (VOC) plumes leached from shallow source zones [Review]. J Contam Hydrol 123: 130-156. <http://dx.doi.org/10.1016/j.jconhyd.2010.12.013>
- [Robertson, JO; Chilingar, GV; Khilyuk, LF; Endres, B.](#) (2012). Migration of gas from oil/gas fields. Energy Source Part A 34: 1436-1447. <http://dx.doi.org/10.1080/15567030903077899>
- [Rodvelt, GD; Yeager, VI; Hyatt, MA.](#) (2013). Case history: challenges using ultraviolet light to control bacteria in Marcellus completions. In 2011 SPE eastern regional meeting. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/149445-MS>

- [Rolls, RJ; Leigh, C; Sheldon, F.](#) (2012). Mechanistic effects of low-flow hydrology on riverine ecosystems: ecological principles and consequences of alteration. *Freshwater Science* 31: 1163-1186. <http://dx.doi.org/10.1899/12-002.1>
- [Ross, D; King, G.](#) (2007). Well completions. In MJ Economides; T Martin (Eds.), *Modern fracturing: Enhancing natural gas production* (1 ed., pp. 169-198). Houston, Texas: ET Publishing.
- [Rowan, EL; Engle, MA; Kirby, CS; Kraemer, TF.](#) (2011). Radium content of oil- and gas-field produced waters in the northern Appalachian Basin (USA): Summary and discussion of data. (Scientific Investigations Report 20115135). Reston, VA: U.S. Geological Survey. <http://pubs.usgs.gov/sir/2011/5135/>
- [Rowan, EL; Engle, MA; Kraemer, TF; Schroeder, KT; Hammack, RW; Doughten, MW.](#) (2015). Geochemical and isotopic evolution of water produced from Middle Devonian Marcellus shale gas wells, Appalachian basin, Pennsylvania. *AAPG Bulletin* 99: 181-206. <http://dx.doi.org/10.1306/07071413146>
- [Rowe, D; Muehlenbachs, K.](#) (1999). Isotopic fingerprints of shallow gases in the Western Canadian sedimentary basin: tools for remediation of leaking heavy oil wells. *Organic Geochemistry* 30: 861-871. [http://dx.doi.org/10.1016/S0146-6380\(99\)00068-6](http://dx.doi.org/10.1016/S0146-6380(99)00068-6)
- [Roy, SB; Ricci, PF; Summers, KV; Chung, CF; Goldstein, RA.](#) (2005). Evaluation of the sustainability of water withdrawals in the United States, 1995 to 2025. *J Am Water Resour Assoc* 41: 1091-1108.
- [Roychaudhuri, B; Tsotsis, TT; Jessen, K.](#) (2011). An experimental and numerical investigation of spontaneous imbibition in gas shales. Paper presented at SPE Annual Technical Conference and Exhibition, October 30 - November 2, 2011, Denver, Colorado.
- [Rozell, DJ; Reaven, SJ.](#) (2012). Water pollution risk associated with natural gas extraction from the Marcellus Shale. *Risk Anal* 32: 13821393. <http://dx.doi.org/10.1111/j.1539-6924.2011.01757.x>
- [Rupp, B; Appel, KE; Gundert-Remy, U.](#) (2010). Chronic oral LOAEL prediction by using a commercially available computational QSAR tool. *Arch Toxicol* 84: 681-688. <http://dx.doi.org/10.1007/s00204-010-0532-x>
- [Rushing, JA; Newsham, KE; Blasingame, TA.](#) (2013). Rock typing: Keys to understanding productivity in tight gas sands. SPE Unconventional Reservoirs Conference, February 10-12, 2008, Keystone, Colorado, USA.
- [Rushton, L; Castaneda, C.](#) (2014). Drilling into hydraulic fracturing and the associated wastewater management issues. Washington, WD: Paul Hastings, LLP. <http://www.paulhastings.com/docs/default-source/PDFs/stay-current-hydraulic-fracturing-wastewater-management.pdf>
- [Rutledge, JT; Phillips, WS.](#) (2003). Hydraulic stimulation of natural fractures as revealed by induced microearthquakes, Carthage Cotton Valley gas field, east Texas. *Geophysics* 68: 441-452. <http://dx.doi.org/10.1190/1.1567214>
- [Rutqvist, J; Rinaldi, AP; Cappa, F; Moridis, GJ.](#) (2013). Modeling of fault reactivation and induced seismicity during hydraulic fracturing of shale-gas reservoirs. *Journal of Petroleum Science and Engineering* 107: 31-44. <http://dx.doi.org/10.1016/j.petrol.2013.04.023>
- [Rutqvist, J; Rinaldi, AP; Cappa, F; Moridis, GJ.](#) (2015). Modeling of fault activation and seismicity by injection directly into a fault zone associated with hydraulic fracturing of shale-gas reservoirs. *Journal of Petroleum Science and Engineering* 127: 377-386. <http://dx.doi.org/10.1016/j.petrol.2015.01.019>
- [Saba, T; Mohsen, F; Garry, M; Murphy, B; Hilbert, B.](#) (2012). White paper: Methanol use in hydraulic fracturing fluids. (1103844.000 0101 0711 TS26). Maynard, MA: Exponent.
- [Sabins, F.](#) (1990). Problems in cementing horizontal wells. *J Pet Tech* 42: 398-400. <http://dx.doi.org/10.2118/20005-PA>

- [SAIC and GES](#) (SAIC Energy, Environment & Infrastructure, LLC and Groundwater & Environmental Services, Inc). (2011). ATGAS investigation initial site characterization and response, April 19, 2011 to May 2, 2011, ATGAS2H Well Pad, permit no. 37-015-21237, Leroy Township, Bradford County, PA. Harrisburg, Pennsylvania: Chesapeake Appalachia, LLC.
http://www.chk.com/news/articles/documents/atgas_initial_site_characterization_report_final_08292011.pdf
- [Saiers, JE; Barth, E.](#) (2012). Comment on 'Potential contaminant pathways from hydraulically fractured shale aquifers' [Comment]. Ground Water 50: 826-828; discussion 828-830. <http://dx.doi.org/10.1111/j.1745-6584.2012.00990.x>
- [Sang, W; Stoof, CR; Zhang, W; Morales, VL; Gao, B; Kay, RW; Liu, L; Zhang, Y; Steenhuis, TS.](#) (2014). Effect of hydrofracking fluid on colloid transport in the unsaturated zone. Environ Sci Technol 48: 8266-8274.
<http://dx.doi.org/10.1021/es501441e>
- [Santa Cruz Biotechnology.](#) (2015). Sorbitane trioleate (CAS 26266-58-0). Available online at <http://www.scbt.com/datasheet-281154-Sorbitane-Trioleate.html> (accessed April 6, 2015).
- [Scanlon, BR; Reedy, RC; Nicot, JP.](#) (2014). Will water scarcity in semiarid regions limit hydraulic fracturing of shale plays? Environmental Research Letters 9. <http://dx.doi.org/10.1088/1748-9326/9/12/124011>
- [Schindler, DW.](#) (1997). Widespread effects of climatic warming on freshwater ecosystems in North America. Hydrolog Process 11: 1043-1067.
- [Schlegel, ME; McIntosh, JC; Petsch, ST; Orem, WH; Jones, EJP; Martini, AM.](#) (2013). Extent and limits of biodegradation by in situ methanogenic consortia in shale and formation fluids. Appl Geochem 28: 172-184. <http://dx.doi.org/10.1016/j.apgeochem.2012.10.008>
- [Schlumberger](#) (Schlumberger Limited). (2006). Fundamentals of formation testing. Sugar Land, Texas.
http://www.slb.com/~media/Files/evaluation/books/fundamentals_formation_testing_overview.pdf
- [Schlumberger](#) (Schlumberger Limited). (2014). Schlumberger oilfield glossary. Available online at <http://www.glossary.oilfield.slb.com/>
- [Schlumberger](#) (Schlumberger Limited). (2015). Stimulation. Available online at <http://www.slb.com/services/completions/stimulation.aspx>
- [Schmidley, EB; Smith, BJ.](#) (2011). Personal communication from Schmidley and Smith to DiCello: CAWP Addendum EM Survey & Well Location; XTO Energy, Inc. Marquardt Release. Available online
- [Schmidt, CW.](#) (2013). Estimating wastewater impacts from fracking. Environ Health Perspect 121: A117.
<http://dx.doi.org/10.1289/ehp.121-a117>
- [Schmidt, V; McDonald, DA.](#) (1979). The role of secondary porosity in the course of sandstone diagenesis. In PA Schole; PR Schluger (Eds.), Aspects of diagenesis : based on symposia sponsored by the Eastern and by the Rocky Mountain Sections, The Society of Economic Paleontologists and Mineralogists (pp. 175-207). Tulsa, OK: The Society of Economic Paleontologists and Mineralogists (SEPM).
http://archives.datapages.com/data/sepm_sp/SP26/The_Role_of_Secondary_Porosity.html
- [Schnoor, JL.](#) (1996). Environmental modeling: Fate and transport of pollutants in water, air, and soil. In Environmental modeling: Fate and transport of pollutants in water, air, and soil (1 ed.). Hoboken, NJ: Wiley-Interscience.
- [Schubert, J; Rosenmeier, J; Zatezalo, M.](#) (2014). A review of NORM/TENORM in wastes and waters associated with Marcellus shale gas development and production. In CL Meehan; JM Vanbriesen; F Vahedifard; X Yu; C Quiroga (Eds.), Shale energy engineering 2014: technical challenges, environmental issues, and public policy (pp. 492-501). Reston, VA: American Society of Civil Engineers.
<http://dx.doi.org/10.1061/9780784413654.052>

- [Schwarzenbach, RP; Gschwend, PM; Imboden, DM.](#) (2002). Environmental Organic Chemistry. In Environmental organic chemistry (2 ed.). Hoboken, NJ: John Wiley & Sons, Inc.
- [Science Applications International Corporation.](#) (2010). XTO - Marquardt pad soil and water corrective action workplan. (XTO-EPA0001074). Indiana, PA: XTO Energy.
- [Science Based Solutions LLC.](#) (2014). Summary of hydrogeology investigations in the Mamm Creek field area, Garfield County, Laramie, Wyoming. <http://www.garfield-county.com/oil-gas/documents/Summary-Hydrogeologic-Studies-Mamm%20Creek-Area-Feb-10-2014.pdf>
- [Senior, LA.](#) (2014). A reconnaissance spatial and temporal baseline assessment of methane and inorganic constituents in groundwater in bedrock aquifers, pike county, Pennsylvania, 201213 (pp. i-106). (2014-5117). Senior, LA. <http://pubs.usgs.gov/sir/2014/5117/support/sir2014-5117.pdf>
- [Shafer, L.](#) (2011). Water recycling and purification in the Pinedale anticline field: results from the anticline disposal project. In 2011 SPE Americas E&P health, safety, security & environmental conference. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/141448-MS>
- [Shaffer, DL; Arias Chavez, LH; Ben-Sasson, M; Romero-Vargas Castrillón, S; Yip, NY; Elimelech, M.](#) (2013). Desalination and reuse of high-salinity shale gas produced water: drivers, technologies, and future directions. Environ Sci Technol 47: 9569-9583.
- [Shapiro, SA; Krüger, OS; Dinske, C; Langenbruch, C.](#) (2011). Magnitudes of induced earthquakes and geometric scales of fluid-stimulated rock volumes. Geophysics 76: WC55-WC63. <http://dx.doi.org/10.1190/geo2010-0349.1>
- [Sharma, S; Bowman, L; Schroeder, K; Hammack, R.](#) (2014a). Assessing changes in gas migration pathways at a hydraulic fracturing site: Example from Greene County, Pennsylvania, USA. Appl Geochem. <http://dx.doi.org/10.1016/j.apgeochem.2014.07.018>
- [Sharma, S; Mulder, ML; Sack, A; Schroeder, K; Hammack, R.](#) (2014b). Isotope approach to assess hydrologic connections during Marcellus Shale drilling. Ground Water 52: 424433. <http://dx.doi.org/10.1111/gwat.12083>
- [Sheng, Z.](#) (2005). An aquifer storage and recovery system with reclaimed wastewater to preserve native groundwater resources in El Paso, Texas. J Environ Manage 75: 367-377. <http://dx.doi.org/10.1016/j.jenvman.2004.10.007>
- [Shires, T; Lev-On, M.](#) (2012). Characterizing pivotal sources of methane emissions from unconventional natural gas production - summary and analysis of API and ANGA survey responses. Washington, DC: American Petroleum Institute. American Natural Gas Alliance.
- [Siegel, DI; Azzolina, NA; Smith, BJ; Perry, AE; Bothun, RL.](#) (In Press) Methane concentrations in water wells unrelated to proximity to existing oil and gas wells in northeastern Pennsylvania. Environ Sci Technol. <http://dx.doi.org/10.1021/es505775c>
- [Silva, JM; Matis, H; Kostedt, WL; Watkins, V.](#) (2012). Produced water pretreatment for water recovery and salt production. (08122-36). Niskayuna, NY: Research Partnership to Secure Energy for America. [http://www.rpsea.org/media/files/project/18621900/08122-36-FR-Pretreatment Water Mgt Frac Water Reuse Salt-01-26-12.pdf](http://www.rpsea.org/media/files/project/18621900/08122-36-FR-Pretreatment%20Water%20Mgt%20Frac%20Water%20Reuse%20Salt-01-26-12.pdf)
- [Šimuněk, J; Šejna, M; van Genuchten, MT.](#) (1998). The HYDRUS-1D software package for simulating the one-dimensional movement of water, heat, and multiple solutes in variably-saturated media, Version 2.0, IGWMC-TPS-70. Available online
- [Sionix](#) (Sionix Corporation). (2011). Sionix to build Bakken water treatment plant. Retrieved from http://www.rigzone.com/news/article_pf.asp?a_id=110613
- [Sirivedhin, T; Dallbauman, L.](#) (2004). Organic matrix in produced water from the Osage-Skiatook petroleum environmental research site, Osage county, Oklahoma. Chemosphere 57: 463-469.

- Sjolander, SA; Clark, J; Rizzo, D; Turack, J. (2011). Water facts #31: Introduction to hydrofracturing. University Park, PA: Penn State College of Agricultural Sciences - Cooperative Extension. http://www.shale-gas-information-platform.org/fileadmin/ship/dokumente/introduction_to_hydrofracturing-2.pdf
- Skalak, KJ; Engle, MA; Rowan, EL; Jolly, GD; Conko, KM; Benthem, AJ; Kraemer, TE. (2014). Surface disposal of produced waters in western and southwestern Pennsylvania: Potential for accumulation of alkali-earth elements in sediments. *Int J Coal Geol* 126: 162-170. <http://dx.doi.org/10.1016/j.coal.2013.12.001>
- Skjerven, T; Lunde, Ø; Perander, M; Williams, B; Farquhar, R; Sinet, J; Sæby, J; Haga, HB; Finnseth, Ø; Johnsen, S. (2011). Norwegian Oil and Gas Association recommended guidelines for well integrity. (117, Revision 4). Norway: Norwegian Oil and Gas Association. <http://www.norskoljeoggass.no/Global/Retningslinjer/Boring/117%20-%20Recommended%20guidelines%20Well%20integrity%20rev4%2006.06.%2011.pdf>
- Skoumal, RJ; Brudzinski, MR; Currie, BS. (2015). Earthquakes induced by hydraulic fracturing in Poland Township, Ohio. *Seismological Society of America Bulletin* 105: 189-197. <http://dx.doi.org/10.1785/0120140168>
- Stutz, J; Anderson, J; Broderick, R; Horner, P. (2012). Key shale gas water management strategies: An economic assessment tool. Paper presented at International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production, September 11-13, 2012, Perth, Australia.
- Smolen, JJ. (2006). Cased hole and production log evaluation. Tulsa, OK: PennWell Books.
- Soeder, DJ; Kappel, WM. (2009). Water resources and natural gas production from the Marcellus shale [Fact Sheet] (pp. 6). (U.S. Geological Survey, Fact Sheet 20093032). Soeder, DJ; Kappel, WM. <http://pubs.usgs.gov/fs/2009/3032/pdf/FS2009-3032.pdf>
- Solley, WB; Pierce, RR; Perlman, HA. (1998). Estimated use of water in the United States in 1995. (USGS Circular: 1200). U.S. Geological Survey. <http://pubs.er.usgs.gov/publication/cir1200>
- Spellman, FR. (2012). Environmental impacts of hydraulic fracturing. In *Environmental impacts of hydraulic fracturing*. Boca Raton, Florida: CRC Press.
- SRBC (Susquehanna River Basin Commission). (2013). Comprehensive plan for the water resources of the Susquehanna River basin. Harrisburg, PA. <http://www.srbc.net/planning/comprehensiveplan.htm>
- States, S; Cyprych, G; Stoner, M; Wydra, F; Kuchta, J; Monnell, J; Casson, L. (2013). Marcellus Shale drilling and brominated THMs in Pittsburgh, Pa., drinking water. *J Am Water Works Assoc* 105: E432-E448. <http://dx.doi.org/10.5942/jawwa.2013.105.0093>
- Stewart, DR. (2013a). Analytical testing for hydraulic fracturing fluid water recovery and reuse. In *Summary of the technical workshop on analytical chemical methods* (pp. B6-B10). Stewart, DR. <http://www2.epa.gov/sites/production/files/documents/analytical-chemical-methods-technical-workshop-summary.pdf>
- Stewart, DR. (2013b). Treatment for beneficial use of produced water and hydraulic fracturing flowback water. Presentation presented at US EPA Technical Workshop on Wastewater Treatment and Related Modeling For Hydraulic Fracturing, April 18, 2013, Research Triangle Park, NC.
- Stinger Wellhead Protection, I. nc. (2010). Stinger Wellhead Protection. Houston, TX: Stinger Wellhead Protection, Inc. http://etdevelopers.com/design-preview/STS/product-catalog/STS_Product_Catalog_2010-SWP.pdf
- STO (Statoil). (2013). Shale facts: drilling and hydraulic fracturing, how it's done, responsibly. (Global Version, April 2013). Stavanger, Norway. http://www.statoil.com/no/OurOperations/ExplorationProd/ShaleGas/FactSheets/Downloads/Shale_DrillingHydraulicFracturing.pdf

- [Stringfellow, WT; Domen, JK; Camarillo, MK; Sandelin, WL; Borglin, S.](#) (2014). Physical, chemical, and biological characteristics of compounds used in hydraulic fracturing. *J Hazard Mater* 275: 37-54. <http://dx.doi.org/10.1016/j.jhazmat.2014.04.040>
- [Strong, L; Gould, T; Kasinkas, L; Sadowsky, M; Aksan, A; Wackett, L.](#) (2013). Biodegradation in waters from hydraulic fracturing: chemistry, microbiology, and engineering. *J Environ Eng* 140: B4013001. [http://dx.doi.org/10.1061/\(ASCE\)EE.1943-7870.0000792](http://dx.doi.org/10.1061/(ASCE)EE.1943-7870.0000792)
- [STRONGER](#) (State Review of Oil and Natural Gas Environmental Regulations). (2011a). Louisiana hydraulic fracturing state review. Oklahoma City, OK. <http://www.strongerinc.org/sites/all/themes/stronger02/downloads/Final%20Louisiana%20HF%20Review%203-2011.pdf>
- [STRONGER](#) (State Review of Oil and Natural Gas Environmental Regulations). (2011b). Ohio hydraulic fracturing state review. Oklahoma City, OK. <http://www.strongerinc.org/sites/all/themes/stronger02/downloads/Final%20Report%20of%202011%20OH%20HF%20Review.pdf>
- [STRONGER](#) (State Review of Oil and Natural Gas Environmental Regulations). (2012). Arkansas hydraulic fracturing state review. Oklahoma City, OK. http://www.aogc.state.ar.us/notices/AR_HFR_FINAL.pdf
- [Sturchio, NC; Banner, JL; Binz, CM; Heraty, LB; Musgrove, M.](#) (2001). Radium geochemistry of ground waters in Paleozoic carbonate aquifers, midcontinent, USA. *Appl Geochem* 16: 109-122.
- [Sumi, L.](#) (2004). Pit pollution: Backgrounder on the issues, with a New Mexico case study. Washington, DC: Earthworks: Oil and Gas Accountability Project. <http://www.earthworksaction.org/files/publications/PitReport.pdf>
- [Sun, M; Lowry, GV; Gregory, KB.](#) (2013). Selective oxidation of bromide in wastewater brines from hydraulic fracturing. *Water Res* 47: 3723-3731. <http://dx.doi.org/10.1016/j.watres.2013.04.041>
- [Swann, C; Matthews, J; Ericksen, R; Kuszaul, J.](#) (2004). Evaluations of radionuclides of uranium, thorium, and radium with produced fluids, precipitates, and sludges from oil, gas, and oilfield brine injections wells. (DE-FG26-02NT 15227). Washington, D.C.: U.S. Department of Energy. http://www.olemiss.edu/depts/mmri/programs/norm_final.pdf
- [Swanson, VE.](#) (1955). Uranium in marine black shales of the United States. In Contributions to the geology of uranium and thorium by the United States Geological Survey and Atomic Energy Commission for the United Nations International Conference on Peaceful Uses of Atomic Energy, Geneva, Switzerland, 1955 (pp. 451-456). Reston, VA: U.S. Geological Survey. <http://pubs.usgs.gov/pp/0300/report.pdf>
- [SWN](#) (Southwestern Energy). (2011). Frac fluid whats in it? Houston, TX. http://www.swn.com/operations/documents/frac_fluid_fact_sheet.pdf
- [SWN](#) (Southwestern Energy). (2014). Field Site Visit at Southwestern Energy. Available online
- [Syed, T; Cutler, T.](#) (2010). Well integrity technical and regulatory considerations for CO2 injection wells. In 2010 SPE international conference on health, safety & environment in oil and gas exploration and production. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/125839-MS>
- [Taylor, A.](#) (2012). Watering the boom in Oklahoma: supplies, demands, and neighbors. Presentation presented at 2012 Kansas Water Issues Forums, February 29-March 1, 2012, Wichita and Hays, Kansas.
- [Taylor, RS; Lestz, RS; Loree, D; Funkhouser, GP; Fyten, G; Attaway, D; Watkins, H.](#) (2006). Optimized CO2 miscible hydrocarbon fracturing fluids. Calgary, Alberta, Canada: Petroleum Society of Canada. <http://dx.doi.org/10.2118/2006-168>
- [The Royal Society and the Royal Academy of Engineering.](#) (2012). Shale gas extraction in the UK: A review of hydraulic fracturing. London. http://www.raeng.org.uk/news/publications/list/reports/Shale_Gas.pdf

- [Thompson, AM.](#) (2010) Induced fracture detection in the Barnett Shale, Ft. Worth Basin, Texas. (Master's Thesis). University of Oklahoma, Norman, OK.
- [Thordsen, JJ.; Kharaka, YK; Ambats, G; Kakouros, E; Abbott, MM.](#) (2007). Geochemical data from produced water contamination investigations: Osage-Skiatook Petroleum Environmental Research (OSPER) sites, Osage County, Oklahoma. (Open-File Report 2007-1055). Reston, VA: United States Geological Survey.
- [Tidwell, VC; Kobos, PH; Malczynski, L, enA; Klise, G; Castillo, CR.](#) (2012). Exploring the water-thermoelectric power nexus. *J Water Resour Plann Manag* 138: 491-501. [http://dx.doi.org/10.1061/\(ASCE\)WR.1943-5452.0000222](http://dx.doi.org/10.1061/(ASCE)WR.1943-5452.0000222)
- [Tidwell, VC; Zemlick, K; Klise, G.](#) (2013). Nationwide water availability data for energy-water modeling. Albuquerque, New Mexico: Sandia National Laboratories. <http://prod.sandia.gov/techlib/access-control.cgi/2013/139968.pdf>
- [Tiemann, M; Folger, P; Carter, NT.](#) (2014). Shale energy technology assessment: Current and emerging water practices. Washington, DC: Congressional Research Service. <http://nationalaglawcenter.org/wp-content/uploads/assets/crs/R43635.pdf>
- [Tilley, BJ; Muehlenbachs, K.](#) (2012). Fingerprinting of gas contaminating groundwater and soil in a petroliferous region, Alberta, Canada. In RD Morrison; G O'Sullivan (Eds.), *Environmental forensics: Proceedings of the 211 INEF Conference* (pp. 115-125). London: RSC Publishing. <http://dx.doi.org/10.1039/9781849734967-00115>
- [TIPRO](#) (Texas Independent Producers and Royalty Owners Association). (2012). Bradenhead pressure management. Austin, TX. http://www.tipro.org/UserFiles/BHP_Guidance_Final_071812.pdf
- [Titler, RV; Curry, P.](#) (2011). Chemical analysis of major constituents and trace contaminants of rock salt. Harrisburg, PA: Pennsylvania Department of Environmental Protection. <http://files.dep.state.pa.us/water/Wastewater%20Management/WastewaterPortalFiles/Rock%20Salt%20Paper%20final%20052711.pdf>
- [Tudor, EH; Nevison, GW; Allen, S; Pike, B.](#) (2009). Case study of a novel hydraulic fracturing method that maximizes effective hydraulic fracture length. In 2009 SPE annual technical conference & exhibition. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/124480-MS>
- [TWDB](#) (Texas Water Development Board). (2012). Water for Texas 2012 state water plan. Austin, TX. <http://www.twdb.state.tx.us/waterplanning/swp/2012/index.asp>
- [Tyrrell, P.](#) (2012). Water needs for oil & gas well drilling and fracturing. Presentation presented at 85th Annual AWSE Fall Conference, September 23-26, 2012, Omaha, Nebraska.
- [Tyrrell, P.](#) (2013). Wyoming update: water rights for hydraulic fracturing. Presentation presented at Summer 172nd Western States Water Council Meeting, June 24-26, 2013, Casper, Wyoming.
- [U.S. Army Corps of Engineers.](#) (2011). Final Garrison Dam/Lake Sakakawea project, North Dakota surplus water report. Volume 1. Omaha, NE: The U.S. Army Corps of Engineers, Omaha District. <http://www.swc.nd.gov/4dlink9/4dcgi/GetSubContentPDF/PB-2811/Garrison%20Dam%20Lake%20Sakakawea%20Surplus%20Water%20Report.pdf>
- [U.S. Census Bureau.](#) (2010). Special release - census blocks with population and housing unit counts, 2010 TIGER/Line shapefiles [Computer Program]. Suitland, MD: U.S. Census Bureau, Geography Division. Retrieved from <https://www.census.gov/geo/maps-data/data/tiger-line.html>
- [U.S. Census Bureau.](#) (2013a). Annual estimates of the resident population: April 1, 2010 to July 1, 2013. Suitland, MD: U.S. Census Bureau, Population Division. <http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>

- [U.S. Census Bureau](https://www.census.gov/geo/maps-data/data/cbf/cbf_msa.html). (2013b). Cartographic boundary shapefiles metropolitan and micropolitan statistical areas and related statistical areas (Combined statistical areas, 500k). Suitland, MD. Retrieved from https://www.census.gov/geo/maps-data/data/cbf/cbf_msa.html
- [U.S. Census Bureau](http://www.census.gov/population/metro/). (2013c). Metropolitan and micropolitan statistical areas main. Available online at <http://www.census.gov/population/metro/> (accessed January 12, 2015).
- [U.S. Census Bureau](http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml). (2014). American FactFinder. Available online at <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- [U.S. Department of Justice](http://www.justice.gov/usao/ohn/news/2014/05auglupo.html). (2014). Company owner sentenced to more than two years in prison for dumping fracking waste in Mahoning River tributary. Available online at <http://www.justice.gov/usao/ohn/news/2014/05auglupo.html> (accessed March 4, 2015).
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (1991). Manual of individual and non-public water supply systems [EPA Report]. (EPA 570/9-91-004). Washington, D.C.
- [U.S. EPA](http://www.epa.gov/oswer/riskassessment/datause/parta.htm) (U.S. Environmental Protection Agency). (1992). Guidance for data useability in risk assessment (part A) - final. (Publication 9285.7-09A). Washington, D.C. <http://www.epa.gov/oswer/riskassessment/datause/parta.htm>
- [U.S. EPA](http://www.epa.gov/superfund/health/conmedia/soil/pdfs/part_2.pdf) (U.S. Environmental Protection Agency). (1996). Soil screening guidance: technical background document, part 2 [EPA Report] (2nd ed.). (EPA/540/R-95/128). Washington, DC: U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. http://www.epa.gov/superfund/health/conmedia/soil/pdfs/part_2.pdf
- [U.S. EPA](http://www4.nau.edu/itep/waste/hazsubmap/docs/OilSpill/EPAUnderstandingOilSpillsAndOilSpillResponse1999.pdf) (U.S. Environmental Protection Agency). (1999). Understanding oil spills and oil spill response [EPA Report]. (EPA 540-K-99-007). Washington, D.C.: U.S. Environmental Protection Agency, Office of Emergency and Remedial Response. <http://www4.nau.edu/itep/waste/hazsubmap/docs/OilSpill/EPAUnderstandingOilSpillsAndOilSpillResponse1999.pdf>
- [U.S. EPA](http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=51717) (U.S. Environmental Protection Agency). (2002a). A review of the reference dose and reference concentration processes. (EPA/630/P-02/002F). Washington, DC: U.S. Environmental Protection Agency, Risk Assessment Forum. <http://cfpub.epa.gov/ncea/cfm/recordisplay.cfm?deid=51717>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2002b). Toxicological review of benzene (noncancerous effects) [EPA Report]. (EPA/635/R-02/001F). Washington, DC.
- [U.S. EPA](http://www.epa.gov/spc/assess.htm) (U.S. Environmental Protection Agency). (2003). A summary of general assessment factors for evaluating the quality of scientific and technical information [EPA Report]. (EPA/100/B-03/001). Washington, DC: U.S. Environmental Protection Agency, Office of Research and Development. <http://www.epa.gov/spc/assess.htm>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2004). Evaluation of impacts to underground sources of drinking water by hydraulic fracturing of coalbed methane reservoirs. (EPA/816/R-04/003). Washington, DC: U.S. Environmental Protection Agency, Office of Solid Waste.
- [U.S. EPA](http://www.epa.gov/oppt/sf/pubs/p2frame-june05a2.pdf) (U.S. Environmental Protection Agency). (2005). Pollution prevention (P2) framework [EPA Report]. (EPA-748-B-04-001). Washington, DC: Office of Pollution Prevention and Toxics. <http://www.epa.gov/oppt/sf/pubs/p2frame-june05a2.pdf>
- [U.S. EPA](http://water.epa.gov/lawsregs/rulesregs/sdwa/stage2/) (U.S. Environmental Protection Agency). (2006). National Primary Drinking Water Regulations: Stage 2 Disinfectants and Disinfection Byproducts Rule. <http://water.epa.gov/lawsregs/rulesregs/sdwa/stage2/>
- [U.S. EPA](http://nepis.epa.gov/Adobe/PDF/60000N4K.pdf) (U.S. Environmental Protection Agency). (2007). Monitored natural attenuation of inorganic contaminants in ground water: volume 1 technical basis for assessment [EPA Report]. (EPA/600/R-07/139). Washington, D.C. <http://nepis.epa.gov/Adobe/PDF/60000N4K.pdf>

- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2010). Toxicological review of acrylamide (CAS No. 79-06-1) in support of summary information on the Integrated Risk Information System (IRIS) [EPA Report]. (EPA/635/R-07/008F). Washington, DC.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2011a). Design for the Environment program alternatives assessment criteria for hazard evaluation (version 2.0). Washington, D.C.
<http://www2.epa.gov/saferchoice/alternatives-assessment-criteria-hazard-evaluation>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2011b). Ground water cleanup at Superfund Sites [EPA Report]. (EPA 540-K-96 008). Washington, DC: U. S. Environmental Protection Agency, Office Water.
<http://www.epa.gov/superfund/health/conmedia/gwdocs/brochure.htm>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2011c). Plan to study the potential impacts of hydraulic fracturing on drinking water resources [EPA Report]. (EPA/600/R-11/122). Washington, DC: U.S. Environmental Protection Agency, Office of Research and Development.
<http://www2.epa.gov/hfstudy/plan-study-potential-impacts-hydraulic-fracturing-drinking-water-resources-epa600r-11122>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2011d). Terminology services (TS): Vocabulary catalog - IRIS glossary. Available online at
http://ofmpub.epa.gov/sor_internet/registry/termreg/searchandretrieve/glossariesandkeywordlists/search.do?details=&glossaryName=IRIS%20Glossary (accessed May 21, 2015).
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2012a). 5.2 Dissolved oxygen and biochemical oxygen demand. In Water Monitoring and Assessment. <http://water.epa.gov/type/rsl/monitoring/vms52.cfm>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2012b). Estimation Programs Interface Suite for Microsoft Windows (EPI Suite) [Computer Program]. Washington DC: US Environmental Protection Agency. Retrieved from <http://www.epa.gov/oppt/exposure/pubs/episuite.htm>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2012c). Geologic sequestration of carbon dioxide: underground injection control (UIC) program class VI well construction guidance [EPA Report]. (EPA 816-R-11-020). Washington, D.C.
<http://water.epa.gov/type/groundwater/uic/class6/upload/epa816r11020.pdf>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2012d). Oil and natural gas sector: standards of performance for crude oil and natural gas production, transmission, and distribution. Background supplemental technical support document for the final new source performance standards. Washington, D.C. <http://www.epa.gov/airquality/oilandgas/pdfs/20120418tsd.pdf>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2012e). Public drinking water systems: facts and figures. Washington, DC: U.S. Environmental Protection Agency, Office of Water.
<http://water.epa.gov/infrastructure/drinkingwater/pws/factoids.cfm>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2012f). Study of the potential impacts of hydraulic fracturing on drinking water resources: Progress report. (EPA/601/R-12/011). Washington, DC: U.S. Environmental Protection Agency, Office of Research and Development.
<http://nepis.epa.gov/exe/ZyPURL.cgi?Dockey=P100FH8M.txt>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2013a). Data received from oil and gas exploration and production companies, including hydraulic fracturing service companies 2011 to 2013. Non-confidential business information source documents are located in Federal Docket ID: EPA-HQ-ORD2010-0674. Available at <http://www.regulations.gov>.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2013b). Drinking water and ground water statistics, fiscal year 2011. Washington, DC: U.S. Environmental Protection Agency, Office of Water.
<http://water.epa.gov/scitech/datait/databases/drink/sdwisfed/upload/epa816r13003.pdf>

- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2013c). Inventory of U.S. greenhouse gas emissions and sinks: 1990-2011. Washington, DC: U.S. Environmental Protection Agency, Office of Atmospheric Programs. <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2013-Main-Text.pdf>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2013d). Supplemental programmatic quality assurance project plan for work assignment 5-83 technical support for the hydraulic fracturing drinking water assessment. Washington, D.C. <http://www2.epa.gov/sites/production/files/documents/literature-review-qapp1.pdf>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2013e). SW-846 on-line. Available online at <http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm> (accessed April 8, 2015).
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2013f). Toxicological review of 1,4-Dioxane (with inhalation update) (CAS No. 123-91-1) in support of summary information on the Integrated Risk Information System (IRIS) [EPA Report]. (EPA-635/R-11/003-F). Washington, DC.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2013g). XTO Energy, Inc. Settlement. Available online at <http://www2.epa.gov/enforcement/xto-energy-inc-settlement>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014a). Alternatives assessment for the flame retardant decabromodiphenyl ether (DecaBDE). Washington, D.C. <http://www2.epa.gov/saferchoice/partnership-evaluate-flame-retardant-alternatives-decabde-publications>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014b). Development of rapid radiochemical method for gross alpha and gross beta activity concentration in flowback and produced waters from hydraulic fracturing operations [EPA Report]. (EPA/600/R-14/107). Washington, D.C. <http://www2.epa.gov/hfstudy/development-rapid-radiochemical-method-gross-alpha-and-gross-beta-activity-concentration>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014c). Drinking water contaminants. Available online at <http://water.epa.gov/drink/contaminants/>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014d). Flame retardant alternatives for hexabromocyclododecane (HBCD) [EPA Report]. (EPA/740/R-14/001). Washington, D.C. <http://www2.epa.gov/saferchoice/partnership-evaluate-flame-retardant-alternatives-hbcd-publications>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014e). Greenhouse gas reporting program, Subpart W - Petroleum and natural gas systems. Washington, D.C.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014f). Minimizing and managing potential impacts of injection-induced seismicity from class II disposal wells: Practical approaches [EPA Report]. Washington, D.C. <http://www.epa.gov/r5water/uic/ntwg/pdfs/induced-seismicity-201502.pdf>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014g). Quality assurance project plan - Revision no. 2: Data and literature evaluation for the EPA's study of the potential impacts of hydraulic fracturing (HF) on drinking water resources [EPA Report]. Washington, D.C.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014h). Quality management plan- Revision no. 2: Study of the potential impacts of hydraulic fracturing for oil and gas on drinking water resources [EPA Report]. Washington, D.C. <http://www2.epa.gov/hfstudy/quality-management-plan-revision-no-2-study-potential-impacts-hydraulic-fracturing-oil-and>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014i). Retrospective case study in northeastern Pennsylvania: study of the potential impacts of hydraulic fracturing on drinking water resources [EPA Report]. (EPA 600/R-14/088). Washington, D.C.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014j). Safe drinking water information system (SDWIS). Data obtained from the Office of Water [Database]. Washington, D.C.: Office of Water. Retrieved from <http://water.epa.gov/scitech/datait/databases/drink/sdwisfed/index.cfm>

- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2014k). The verification of a method for detecting and quantifying diethylene glycol, triethylene glycol, tetraethylene glycol, 2-butoxyethanol and 2-methoxyethanol in ground and surface waters [EPA Report]. (EPA/600/R-14/008). Washington, D.C. <http://www2.epa.gov/hfstudy/verification-method-detecting-and-quantifying-diethylene-glycol-triethylene-glycol>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015a). Analysis of hydraulic fracturing fluid data from the FracFocus chemical disclosure registry 1.0 [EPA Report]. (EPA/601/R-14/003). Washington, D.C.: Office of Research and Development, U.S. Environmental Protection Agency. <http://www2.epa.gov/hfstudy/analysis-hydraulic-fracturing-fluid-data-fracfocus-chemical-disclosure-registry-1-pdf>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015b). Analysis of hydraulic fracturing fluid data from the FracFocus chemical disclosure registry 1.0: Project database [EPA Report]. (EPA/601/R-14/003). Washington, D.C.: U.S. Environmental Protection Agency, Office of Research and Development. <http://www2.epa.gov/hfstudy/epa-project-database-developed-fracfocus-1-disclosures>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015c). Case study analysis of the impacts of water acquisition for hydraulic fracturing on local water availability [EPA Report]. (EPA/600/R-14/179). Washington, D.C.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015d). DMR spreadsheet Pennsylvania wastewater treatment plants per Region 3 Information Request. Data provided by request. Washington, D.C.: Region 3, U.S. Environmental Protection Agency.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015e). Effluent data from Pennsylvania wastewater treatment plants per Region 3 Information Request. Data provided by request. Washington, D.C.: Region 3, U.S. Environmental Protection Agency.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015f). EPA Enforcement and Compliance History. Online: Effluent Charts: SEECO-Judsonia Water Reuse Recycling Facility. Available online at <http://echo.epa.gov/effluent-charts#AR0052051>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015g). Inventory of U.S. greenhouse gas emissions and sinks: 1990-2013. (EPA 430-R-15-004). Washington, D.C. <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015h). Key documents about mid-Atlantic oil and gas extraction. Available online at http://www.epa.gov/region3/marcellus_shale/#aoinfoww (accessed May 7, 2015).
- [U.S. EPA. National primary drinking water regulations public notification rule and consumer confidence report rule health effects language.](#) (parts 141.201, and 141.151), (U.S. Government Publishing Office 2015i). <http://www.ecfr.gov/cgi-bin/text-id?SID=4d25ec04bc44e54b1efdf307855f3185&node=pt40.23.141&rgn=div5>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015j). Retrospective case study in Killdeer, North Dakota: study of the potential impacts of hydraulic fracturing on drinking water resources [EPA Report]. (EPA 600/R-14/103). Washington, D.C.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015k). Retrospective case study in southwestern Pennsylvania: study of the potential impacts of hydraulic fracturing on drinking water resources [EPA Report]. (EPA 600/R-14/084). Washington, D.C.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015l). Retrospective case study in the Raton Basin, Colorado: study of the potential impacts of hydraulic fracturing on drinking water resources [EPA Report]. (EPA 600/R-14/091). Washington, D.C.

- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015m). Retrospective case study in Wise County, Texas: study of the potential impacts of hydraulic fracturing on drinking water resources [EPA Report]. (EPA 600/R-14/090). Washington, D.C.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015n). Review of state and industry spill data: characterization of hydraulic fracturing-related spills [EPA Report]. (EPA/601/R-14/001). Washington, D.C.: Office of Research and Development, U.S. Environmental Protection Agency.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015o). Review of well operator files for hydraulically fractured oil and gas production wells: Well design and construction [EPA Report]. (EPA/601/R-14/002). Washington, D.C.: Office of Research and Development, U.S. Environmental Protection Agency.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015p). Sources contributing bromide and inorganic species to drinking water intakes on the Allegheny river in western Pennsylvania [EPA Report]. (EPA/600/R-14/430). Washington, D.C.
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015q). Technical development document for proposed effluent limitation guidelines and standards for oil and gas extraction. (EPA-821-R-15-003). Washington, D.C. <http://water.epa.gov/scitech/wastetech/guide/oilandgas/unconv.cfm>
- [U.S. EPA](#) (U.S. Environmental Protection Agency). (2015r). WaterSense: water supply in the U.S. Available online at <http://www.epa.gov/WaterSense/pubs/supply.html> (accessed January 12, 2015).
- [U.S. GAO](#) (U.S. Government Accountability Office). (2012). Energy-water nexus: Information on the quantity, quality, and management of water produced during oil and gas production. (GAO-12-156). Washington, D.C. <http://www.gao.gov/products/GAO-12-156>
- [U.S. GAO](#) (U.S. Government Accountability Office). (2014). Freshwater: Supply concerns continue, and uncertainties complicate planning. Report to Congressional requesters. (GAO-14-430). Washington, DC: U.S. Government Accountability Office (GAO). <http://www.gao.gov/assets/670/663343.pdf>
- [U.S. Global Change Research Program](#). (2009). Global climate change impacts in the United States. New York, NY: Cambridge University Press. <http://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf>
- [Upstream Pumping](#). (2015). Upstream pumping: Wellhead technology and services. Available online at <http://upstreampumping.com/>
- [URS Corporation](#). (2011). Water-related issues associated with gas production in the Marcellus shale: Additives use flowback quality and quantities regulations on-site treatment green technologies alternate water sources water well-testing. (NYSERDA Contract PO Number 10666).
- [USGS](#) (U.S. Geological Survey). (2000). Coal-bed methane: Potential and concerns [Fact Sheet]. (Fact Sheet 123-00). <http://pubs.usgs.gov/fs/fs123-00/fs123-00.pdf>
- [USGS](#) (U.S. Geological Survey). (2002). Natural gas production in the United States [Fact Sheet]. (USGS Fact Sheet FS-113-01). Denver, CO.
- [USGS](#) (U.S. Geological Survey). (2003). Ground-Water depletion across the nation. <http://pubs.usgs.gov/fs/fs-103-03/>
- [USGS](#) (U.S. Geological Survey). (2006). Produced Water Database [Database]: U.S. Geological Survey :: USGS. Retrieved from <http://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsofEnergyProductionandUse/ProducedWaters.aspx#3822110-overview>
- [USGS](#) (U.S. Geological Survey). (2007). Water-quality assessment of the high plains aquifer, 19992004. (Professional Paper 1749). Reston, VA. <http://pubs.usgs.gov/pp/1749/downloads/pdf/P1749front.pdf>

- [USGS](http://pubs.usgs.gov/circ/1337/) (U.S. Geological Survey). (2009). Water quality in the high plains aquifer, Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming, 19992004. Reston, VA. <http://pubs.usgs.gov/circ/1337/>
- [USGS](http://water.usgs.gov/nawqa/vocs/national_assessment/report/glossary.html) (U.S. Geological Survey). (2010). Volatile organic compounds in the nation's ground water and drinking-water supply wells: Supporting information. Glossary. Available online at http://water.usgs.gov/nawqa/vocs/national_assessment/report/glossary.html
- [USGS](http://pubs.usgs.gov/dds/dds-069/dds-069-z/) (U.S. Geological Survey). (2013a). Map of assessed shale gas in the United States, 2012. <http://pubs.usgs.gov/dds/dds-069/dds-069-z/>
- [USGS](http://viewer.nationalmap.gov/viewer/) (U.S. Geological Survey). (2013b). National hydrography dataset: High-resolution flowline data: The national map. Retrieved from <http://viewer.nationalmap.gov/viewer/>
- [USGS](http://waterdata.usgs.gov/nwis) (U.S. Geological Survey). (2013c). National Water Information System (NWIS) [Database]. Retrieved from <http://waterdata.usgs.gov/nwis>
- [USGS](http://energy.usgs.gov/GeneralInfo/HelpfulResources/EnergyGlossary.aspx#) (U.S. Geological Survey). (2014a). Energy glossary and acronym list. Available online at <http://energy.usgs.gov/GeneralInfo/HelpfulResources/EnergyGlossary.aspx#>
- [USGS](http://water.usgs.gov/watuse/data/2010/) (U.S. Geological Survey). (2014b). Estimated use of water in the United States, county-level data for 2010. Reston, VA. <http://water.usgs.gov/watuse/data/2010/>
- [USGS](http://dx.doi.org/10.3133/cir1360) (U.S. Geological Survey). (2014c). The quality of our nations waters water quality in principal aquifers of the United States, 19912010. (Circular 1360). Reston, VA. <http://dx.doi.org/10.3133/cir1360>
- [USGS](http://pubs.usgs.gov/sir/2013/5179/) (U.S. Geological Survey). (2014d). Trends in major-ion constituents and properties for selected sampling sites in the tongue and powder river watersheds, Montana and Wyoming, based on data collected during water years 19802010. (Scientific Investigations Report 20135179). Reston, VA. <http://pubs.usgs.gov/sir/2013/5179/>
- [USGS](http://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsofEnergyProductionandUse/ProducedWaters.aspx#3822349-data) (U.S. Geological Survey). (2014e). U.S. Geological Survey national produced waters geochemical database v2.0 (PROVISIONAL). Available online at <http://energy.usgs.gov/EnvironmentalAspects/EnvironmentalAspectsofEnergyProductionandUse/ProducedWaters.aspx#3822349-data>
- [USGS](http://dx.doi.org/10.3133/fs20143104) (U.S. Geological Survey). (2014f). USGS investigations of water produced during hydrocarbon reservoir development [Fact Sheet]. Reston, VA. <http://dx.doi.org/10.3133/fs20143104>
- [USGS](http://waterwatch.usgs.gov/) (U.S. Geological Survey). (2014g). WaterWatch. Available online at <http://waterwatch.usgs.gov/>
- [USGS](http://dx.doi.org/10.3133/sir20145184) (U.S. Geological Survey). (2014h). Withdrawal and consumption of water by thermoelectric power plants in the United States, 2010. (Scientific Investigations Report 20145184). Reston, VA. <http://dx.doi.org/10.3133/sir20145184>
- [USGS](http://dx.doi.org/10.3133/sir20145131) (U.S. Geological Survey). (2015). Trends in hydraulic fracturing distributions and treatment fluids, additives, proppants, and water volumes applied to wells drilled in the United States from 1947 through 2010 data analysis and comparison to the literature. (U.S. Geological Survey Scientific Investigations Report 20145131). Reston, VA. <http://dx.doi.org/10.3133/sir20145131>
- [UWS](#) (Universal Well Services). (2008). Environmental response plan for field operations. (PATT-EPA-0001060). Meadville, PA: Universal Well Services, Inc.
- [Vaidyanathan, G.](http://www.eenews.net/energywire/stories/1059985587) (2013a). Hydraulic fracturing: when 2 wells meet, spills can often follow. Available online at <http://www.eenews.net/energywire/stories/1059985587> (accessed September 2, 2014).
- [Vaidyanathan, G.](#) (2013b). XTO comes out swinging against 'unwarranted' criminal charges in Pa. E&E News 0.
- [Vaidyanathan, G.](#) (2014). Email communications between Gayathri Vaidyanathan and Ken Klewicki regarding the New Mexico Oil Conservation Division District 3 Well Communication Data. Available online

- [Valko, PP.](#) (2009). Assigning value to stimulation in the Barnett Shale: A simultaneous analysis of 7000 plus production histories and well completion records. Paper presented at SPE Hydraulic Fracturing Technology Conference, January 19-21, 2009, The Woodlands, TX.
- [van Vliet, MTH; Zwolsman, JJG.](#) (2008). Impact of summer droughts on the water quality of the Meuse river. *J Hydrol* 353: 1-17. <http://dx.doi.org/10.1016/j.jhydrol.2008.01.001>
- [Van Voast, WA.](#) (2003). Geochemical signature of formation waters associated with coalbed methane. *AAPG Bulletin* 87: 667-676.
- [Veil, JA.](#) (2011). Water management practices used by Fayetteville shale gas producers. (ANL/EVS/R-11/5). Washington, DC: U.S. Department of Energy, National Energy Technology Laboratory. <http://www.ipd.anl.gov/anlpubs/2011/06/70192.pdf>
- [Veil, JA; Puder, MG; Elcock, D; Redweik, RJ.](#) (2004). A white paper describing produced water from production of crude oil, natural gas, and coalbed methane. Lemont, IL: Argonne National Laboratory.
- [Vengosh, A; Jackson, RB; Warner, N; Darrah, TH; Kondash, A.](#) (2014). A critical review of the risks to water resources from unconventional shale gas development and hydraulic fracturing in the United States. *Environ Sci Technol* 48: 36-52. <http://dx.doi.org/10.1021/es405118y>
- [Venkatapathy, R; Moudgal, CJ; Bruce, RM.](#) (2004). Assessment of the oral rat chronic lowest observed adverse effect level model in TOPKAT, a QSAR software package for toxicity prediction. *J chem inf comput sci* 44: 1623-1629. <http://dx.doi.org/10.1021/ci049903s>
- [Verdegem, MCJ; Bosma, RH.](#) (2009). Water withdrawal for brackish and inland aquaculture, and options to produce more fish in ponds with present water use. *Water Policy* 11: 52-68. <http://dx.doi.org/10.2166/wp.2009.003>
- [Vidas, H; Hugman, B.](#) (2008). Availability, economics, and production potential of North American unconventional natural gas supplies. (F-2008-03). Washington, DC: The INGAA Foundation, Inc. <http://www.ingaa.org/File.aspx?id=7878>
- [Vidic, RD; Brantley, SL; Vandenbossche, JM; Yoxheimer, D; Abad, JD.](#) (2013). Impact of shale gas development on regional water quality [Review]. *Science* 340: 1235009. <http://dx.doi.org/10.1126/science.1235009>
- [Vincent, M.](#) (2011). Restimulation of unconventional reservoirs: when are refracs beneficial? *Journal of Canadian Petroleum Technology* 50: 36-52. <http://dx.doi.org/10.2118/136757-PA>
- [Vine, JD; Tourtelot, EB.](#) (1970). Geochemistry of black shale deposits; A summary report. *Econ Geol* 65: 253-272. <http://dx.doi.org/10.2113/gsecongeo.65.3.253>
- [Vittitow, JG, Sr.](#) (2010). Well control incident analysis, EOG Resources Inc., Punxautawney Hunting Club 36H, Clearfield County, Pennsylvania. Bedrock Engineering. http://www.pahouse.com/EnvResources/documents/BEDROCK_ENGINEERING_PHC_36H_Incident_Report_Final.pdf
- [Volz, CD; Ferrar, K; Michanowicz, D; Christen, C; Kearney, S; Kelso, M; Malone, S.](#) (2011). Contaminant Characterization of Effluent from Pennsylvania Brine Treatment Inc., Josephine Facility Being Released into Blacklick Creek, Indiana County, Pennsylvania: Implications for Disposal of Oil and Gas Flowback Fluids from Brine Treatment Plants [Standard]. Volz, CD; Ferrar, K; Michanowicz, D; Christen, C; Kearney, S; Kelso, M; Malone, S. <http://www2.epa.gov/hfstudy/contaminant-characterization-effluent-pennsylvania-brine-treatment-inc-josephine-facility>
- [Vulgamore, TB; Clawson, TD; Pope, CD; Wolhart, SL; Mayerhofer, MJ; Machovoe, SR; Waltman, CK.](#) (2007). Applying hydraulic fracture diagnostics to optimize stimulations in the Woodford Shale. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/110029-MS>
- [Waldron, P.](#) (2014). In search of greener fracking for natural gas. Available online at <http://www.insidescience.org/content/search-greener-fracking-natural-gas/1791>

- [Walsh, JM.](#) (2013). Water management for hydraulic fracturing in unconventional resources Part 1. Oil and Gas Facilities 2.
- [Walter, GR; Benke, RR; Pickett, DA.](#) (2012). Effect of biogas generation on radon emissions from landfills receiving radium-bearing waste from shale gas development. J Air Waste Manag Assoc 62: 1040-1049. <http://dx.doi.org/10.1080/10962247.2012.696084>
- [Wang, W; Dahi Taleghani, A.](#) (2014). Cement sheath integrity during hydraulic fracturing: an integrated modeling approach. In 2014 SPE hydraulic fracturing technology conference. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/168642-MS>
- [Wang, Z; Krupnick, A.](#) (2013). A retrospective review of shale gas development in the United States. What led to the boom? (RFF DP 13-12). Washington, DC: Resources for the Future. <http://www.rff.org/RFF/documents/RFF-DP-13-12.pdf>
- [Warner, NR; Christie, CA; Jackson, RB; Vengosh, A.](#) (2013a). Impacts of shale gas wastewater disposal on water quality in western Pennsylvania. Environ Sci Technol 47: 11849-11857. <http://dx.doi.org/10.1021/es402165b>
- [Warner, NR; Jackson, RB; Darrah, TH; Osborn, SG; Down, A; Zhao, K; White, A; Vengosh, A.](#) (2012). Geochemical evidence for possible natural migration of Marcellus Formation brine to shallow aquifers in Pennsylvania. PNAS 109: 11961-11966. <http://dx.doi.org/10.1073/pnas.1121181109>
- [Warner, NR; Kresse, TM; Hays, PD; Down, A; Karr, JD; Jackson, RB; Vengosh, A.](#) (2013b). Geochemical and isotopic variations in shallow groundwater in areas of the Fayetteville Shale development, north-central Arkansas. Appl Geochem 35: 207-220.
- [Warpinski, N.](#) (2009). Microseismic monitoring: Inside and out. J Pet Tech 61: 80-85. <http://dx.doi.org/10.2118/118537-MS>
- [Water Research Foundation.](#) (2010). Assessment of inorganics accumulation in drinking water system scales and sediments. Denver, CO. <http://www.waterrf.org/PublicReportLibrary/3118.pdf>
- [Water Research Foundation.](#) (2014). Water quality impacts of extreme weather-related events. <http://www.waterrf.org/Pages/Projects.aspx?PID=4324>
- [Watson, TL; Bachu, S.](#) (2009). Evaluation of the potential for gas and CO₂ leakage along wellbores. S P E Drilling & Completion 24: 115-126. <http://dx.doi.org/10.2118/106817-PA>
- [Wattenberg, EV; Bielicki, JM; Suchomel, AE; Sweet, JT; Vold, EM; Ramachandran, G.](#) (In Press) Assessment of the acute and chronic health hazards of hydraulic fracturing fluids. J Occup Environ Hyg. <http://dx.doi.org/10.1080/15459624.2015.1029612>
- [Watts, KR.](#) (2006). A Preliminary Evaluation of Vertical Separation between Production Intervals of Coalbed-Methane Wells and Water-Supply Wells in the Raton Basin, Huerfano and Las Animas Counties, Colorado, 1999-2004. 15.
- [WAWSA](#) (Western Area Water Supply Authority). (2011). Project progress report: western area water supply project: appendix N. Williston, ND. <http://www.legis.nd.gov/assembly/62-2011/docs/pdf/wr101011appendixn.pdf>
- [Weaver, JW; Xu, J; Mravik, SC.](#) (In Press) Scenario analysis of the impact on drinking water intakes from bromide in the discharge of treated oil and gas waste water. J Environ Eng.
- [Webb, CH; Nagghappan, L; Smart, G; Hoblitzell, J; Franks, R.](#) (2009). Desalination of oilfield-produced water at the San Ardo water reclamation facility, Ca. In SPE Western regional meeting 2009. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/121520-MS>
- [Weijermars, R.](#) (2014). US shale gas production outlook based on well roll-out rate scenarios. Appl Energy 124: 283-297. <http://dx.doi.org/10.1016/j.apenergy.2014.02.058>

- [Weinhold, B.](#) (2012). The future of fracking: new rules target air emissions for cleaner natural gas production. *Environ Health Perspect* 120: a272-a279. <http://dx.doi.org/10.1289/ehp.120-a272>
- [Weinstein, J.; Phillippi, M.; Walters, HG.](#) (2009). Dry-polymer blending eliminates need for hydrocarbon carrier fluids. In 2009 SPE/EPA/DOE E&P Environmental & Safety Conference. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/121002-MS>
- [Wendel, K.](#) (2011). Wastewater technologies critical for continued growth of Marcellus. Available online at <http://www.ogfi.com/articles/print/volume-8/issue-11/features/wastewater-technologies-critical-for.html> (accessed March 9, 2015).
- [Weng, X; Kresse, O; Cohen, C; Wu, R; Gu, H.](#) (2011). Modeling of hydraulic fracture network propagation in a naturally fractured formation. Paper presented at SPE Hydraulic Fracturing Technology Conference, January 24-26, 2011, The Woodlands, TX.
- [Wertz, J.](#) (2014). Fracking site operator faces contempt complaint after acid spill. Available online at <http://stateimpact.npr.org/oklahoma/2014/08/14/fracking-site-operator-faces-contempt-complaint-after-acid-spill/>
- [Wess, J; Ahlers, H; Dobson, S.](#) (1998). Concise International Chemical Assessment Document 10: 2-Butoxyethanol. World Health Organization. http://www.who.int/ipcs/publications/cicad/cicad_10_revised.pdf
- [West Virginia DEP](#) (West Virginia Department of Environmental Protection). (2011). Memorandum of agreement from the Division of Water and Waste Management to the Division of Highway: WVDOH/WVDEP Salt brine from gas wells agreement. Available online at <http://www.dep.wv.gov/WWE/Documents/WVDOH/WVDEP%20Salt%20Brine%20Agreement.pdf>
- [West Virginia DEP](#) (West Virginia Department of Environmental Protection). (2013). West Virginia water resources management plan. (Article 22-26). Charleston, WV. http://www.dep.wv.gov/WWE/wateruse/WVWaterPlan/Documents/WV_WRMP.pdf
- [West Virginia DEP](#) (West Virginia Department of Environmental Protection). (2014). Personal communication: email from Jason Harmon, West Virginia DEP to Megan Fleming, U.S. EPA with attachment of WV DEP fracturing water database. Available online
- [Whitehead, PG; Wade, AJ; Butterfield, D.](#) (2009). Potential impacts of climate change on water quality and ecology in six UK rivers. 40: 113-122. <http://dx.doi.org/10.2166/nh.2009.078>
- [Whittemore, DO.](#) (2007). Fate and identification of oil-brine contamination in different hydrogeologic settings. *Appl Geochem* 22: 2099-2114. <http://dx.doi.org/10.1016/j.apgeochem.2007.04.002>
- [Williams, JE; Taylor, LE; Low, DJ.](#) (1998). Hydrogeology and Groundwater Quality of the Glaciated Valleys of Bradford, Tioga, and Potter Counties, Pennsylvania. 98.
- [Wilson, B.](#) (2014). Geologic and baseline groundwater evidence for naturally occurring, shallowly sourced, thermogenic gas in northeastern Pennsylvania. *AAPG Bulletin* 98: 373-394. <http://dx.doi.org/10.1306/08061312218>
- [Wilson, JM; Van Briesen, JM.](#) (2013). Source water changes and energy extraction activities in the Monongahela River, 2009-2012. *Environ Sci Technol* 47: 1257512582. <http://dx.doi.org/10.1021/es402437n>
- [Wilson, JM; Vanbriesen, JM.](#) (2012). Oil and gas produced water management and surface drinking water sources in Pennsylvania. *Environmental Practice* 14: 288-300.
- [Wojtanowicz, AK.](#) (2008). Environmental control of well integrity. In ST Orszulik (Ed.), *Environmental technology in the oil industry* (pp. 53-75). Houten, Netherlands: Springer Netherlands.

- [Wolfe, D; Graham, G.](#) (2002). Water rights and beneficial use of produced water in Colorado. Denver, CO: American Water Resources Association. [http://www.gwpc.org/sites/default/files/event-sessions/Dick Wolfe PWC02_0.pdf](http://www.gwpc.org/sites/default/files/event-sessions/Dick%20Wolfe%20PWC02_0.pdf)
- [Wright, PR; McMahon, PB; Mueller, DK; Clark, ML.](#) (2012). Groundwater-quality and quality-control data for two monitoring wells near Pavillion, Wyoming, April and May 2012. (USGS Data Series 718). Reston, Virginia: U.S. Geological Survey. http://pubs.usgs.gov/ds/718/DS718_508.pdf
- [Wuchter, C; Banning, E; Mincer, TJ; Drenzek, NJ; Coolen, MJ.](#) (2013). Microbial diversity and methanogenic activity of Antrim Shale formation waters from recently fractured wells. FMICB 4: 1-14. <http://dx.doi.org/10.3389/fmicb.2013.00367>
- [WYOGCC](#) (Wyoming Oil and Gas Conservation Commission). (2014). Pavillion Field Well Integrity Review. Casper, Wyoming. [http://wogcc.state.wy.us/pavillionworkinggrp/PAVILLION REPORT 1082014 Final Report.pdf](http://wogcc.state.wy.us/pavillionworkinggrp/PAVILLION_REPORT_1082014_Final_Report.pdf)
- [Wyoming State Engineer's Office.](#) (2014). Groundwater control areas and advisory boards. Available online at <http://seo.wyo.gov/ground-water/groundwater-control-areas-advisory-boards>
- [Xu, B; Hill, AD; Zhu, D; Wang, L.](#) (2011). Experimental evaluation of guar fracture fluid filter cake behavior. Paper presented at SPE Hydraulic Fracturing Technology Conference, January 24-26, 2011, The Woodlands, TX.
- [Xu, P; Drewes, JE; Heil, D.](#) (2008). Beneficial use of co-produced water through membrane treatment: Technical-economic assessment. Desalination 225: 139-155. <http://dx.doi.org/10.1016/j.desal.2007.04.093>
- [Yang, Y; Robart, CJ; Ruegamer, M.](#) (2013). Analysis of U.S. Hydraulic Fracturing Design Trends. SPE Hydraulic Fracturing Technology Conference, The Woodlands, Texas, USA.
- [Yeager, RR; Bailey, DE.](#) (2013). Diesel-based gel concentrate improves Rocky Mountain region fracture treatments. Richardson, TX: Society of Petroleum Engineers. <http://dx.doi.org/10.2118/17535-MS>
- [Yergin, D.](#) (2011). The quest : energy, security and the remaking of the modern world. In The quest : energy, security and the remaking of the modern world. New York, NY: Penquin Press.
- [Younos, T; Tulou, KE.](#) (2005). Overview of desalination techniques. Journal of Contemporary Water Research & Education 132: 3-10. <http://dx.doi.org/10.1111/j.1936-704X.2005.mp132001002.x>
- [Zhang, L; Anderson, N; Dilmore, R; Soeder, DJ; Bromhal, G.](#) (2014a). Leakage detection of Marcellus Shale natural gas at an Upper Devonian gas monitoring well: a 3-d numerical modeling approach. Environ Sci Technol 48: 10795-10803. <http://dx.doi.org/10.1021/es501997p>
- [Zhang, T; Gregory, K; Hammack, RW; Vidic, RD.](#) (2014b). Co-precipitation of radium with barium and strontium sulfate and its impact on the fate of radium during treatment of produced water from unconventional gas extraction. Environ Sci Technol 48: 4596-4603. <http://dx.doi.org/10.1021/es405168b>
- [Ziemkiewicz, P; Donovan, J; Hause, J; Gutta, B; Fillhart, J; Mack, B; O'Neal, M.](#) (2013). Water quality literature review and field monitoring of active shale gas wells: Phase II for Assessing Environmental Impacts of Horizontal Gas Well Drilling Operations. Charleston, WV: West Virginia Department of Environmental Protection.
- [Ziemkiewicz, P; Quaranta, ID; Mccawley, M.](#) (2014). Practical measures for reducing the risk of environmental contamination in shale energy production. Environ Sci Process Impacts 16: 1692-1699. <http://dx.doi.org/10.1039/c3em00510k>
- [Zoback, MD.](#) (2010). Reservoir geomechanics. Cambridge, UK: Cambridge University Press.